MT-2020/4040

PMR 8 Channel – LPD 69Channel

Service Manual

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SPECIFICATIONS

STANDARD TEST CONDITIONS

Supply Voltage - Battery	6.0Vdc
Antenna Impedance	50 Ohm
Audio Frequency	1 KHz
Main Signal Input	1mV
Deviation PMR	AF 1 KHz / 1.5 KHz Dev
LPD	AF 1 KHz / 3.0 KHz Dev
Audio Output Power	~1.8Vrms
Audio Output Impedance	8 ohms, non-inductive
Test Temperature	25 •

GENERAL SPECIFICATIONS

Transmitter	CPU Controlled PLL Synthesizer
Receiver system	CPU Controlled double conversion, super-heterodyne
Intermediate Frequency 1st	21.4 MHz
2nd	450 KHz
Operating Frequencies PMR	446.00625MHz ~ 446.09375 MHz
LPD	433.07500 MHz ~ 433.77500 MHz
Frequency Stability	0.0005%
Battery Life	30 hours (typical)
Battery	4pcs AAA size Alkaline Battery or 4.8Vdc Ni-MH Battery Pack
Transmitter/Receiver Switching	Electrical
Ambient Conditions, Temperature / Humidity	-15°c ~ 55°C / 40% ~ 70%

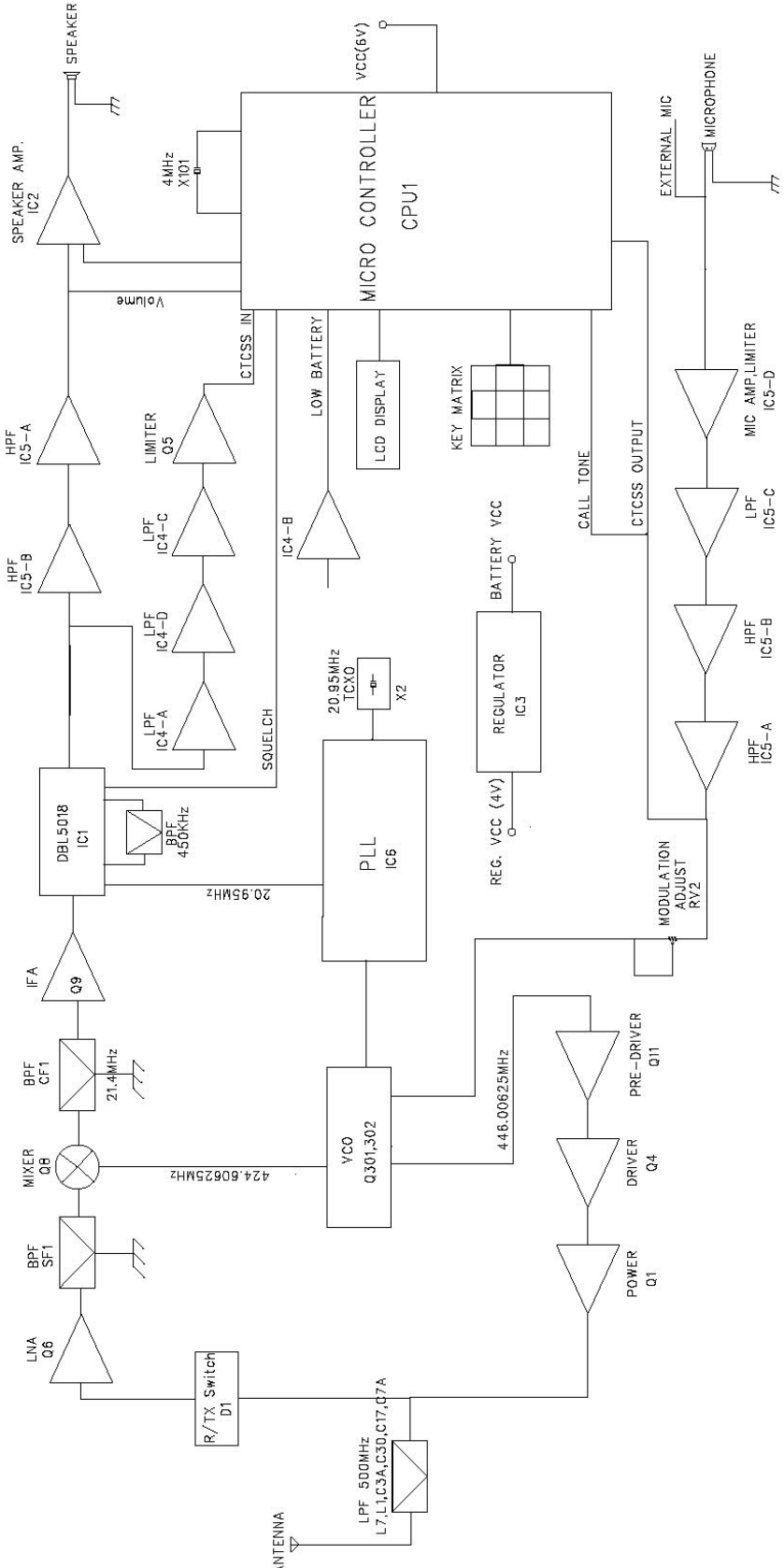
RECEIVER SPECIFICATIONS

Sensitivity	<-120 @12dB SINAD
Audio Output	~2Vrms (w/o load)
Frequency Response	300 Hz ~ 2500 Hz
Image Rejection	54dB
Adjacent Channel Rejection	60dB
Inter Modulation Distortion	60dB
Conducted Rx Spurious	-54dB

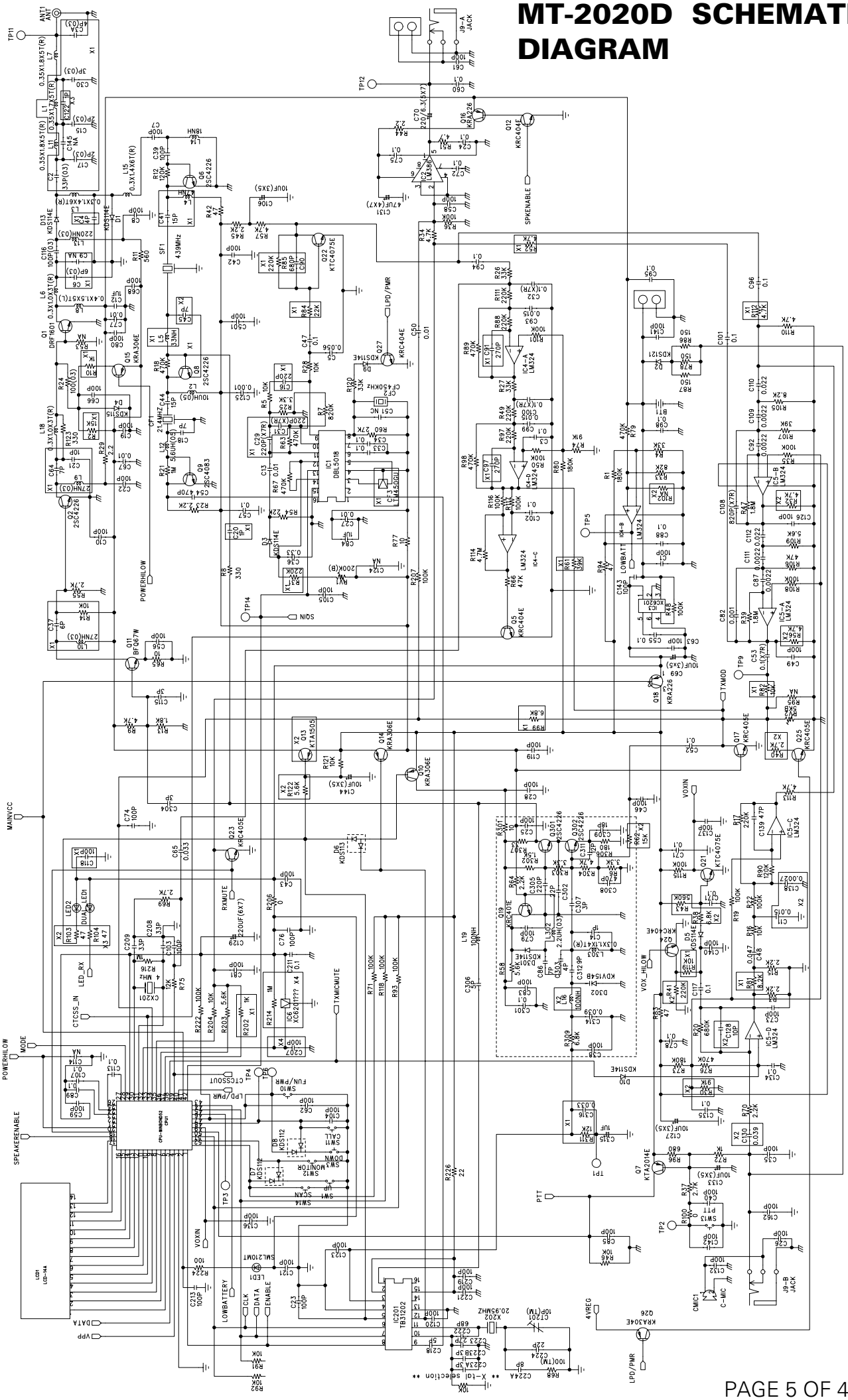
TRANSMITTER SPECIFICATIONS

Output Power(Conducted) PMR Band	500Mw (MT-2020) / 1W,500mW (MT-4040D)
LPD Band	10mW
Max. Deviation PMR	± 2.5 KHz(MAX)
LPD	± 5.0 KHz(MAX)
Frequency Error	5ppm(-15~+55℃)
Current Drain	<500 mA
Spurious Emission(Conducted)	50dB
Antenna Impedance	50 Ohm

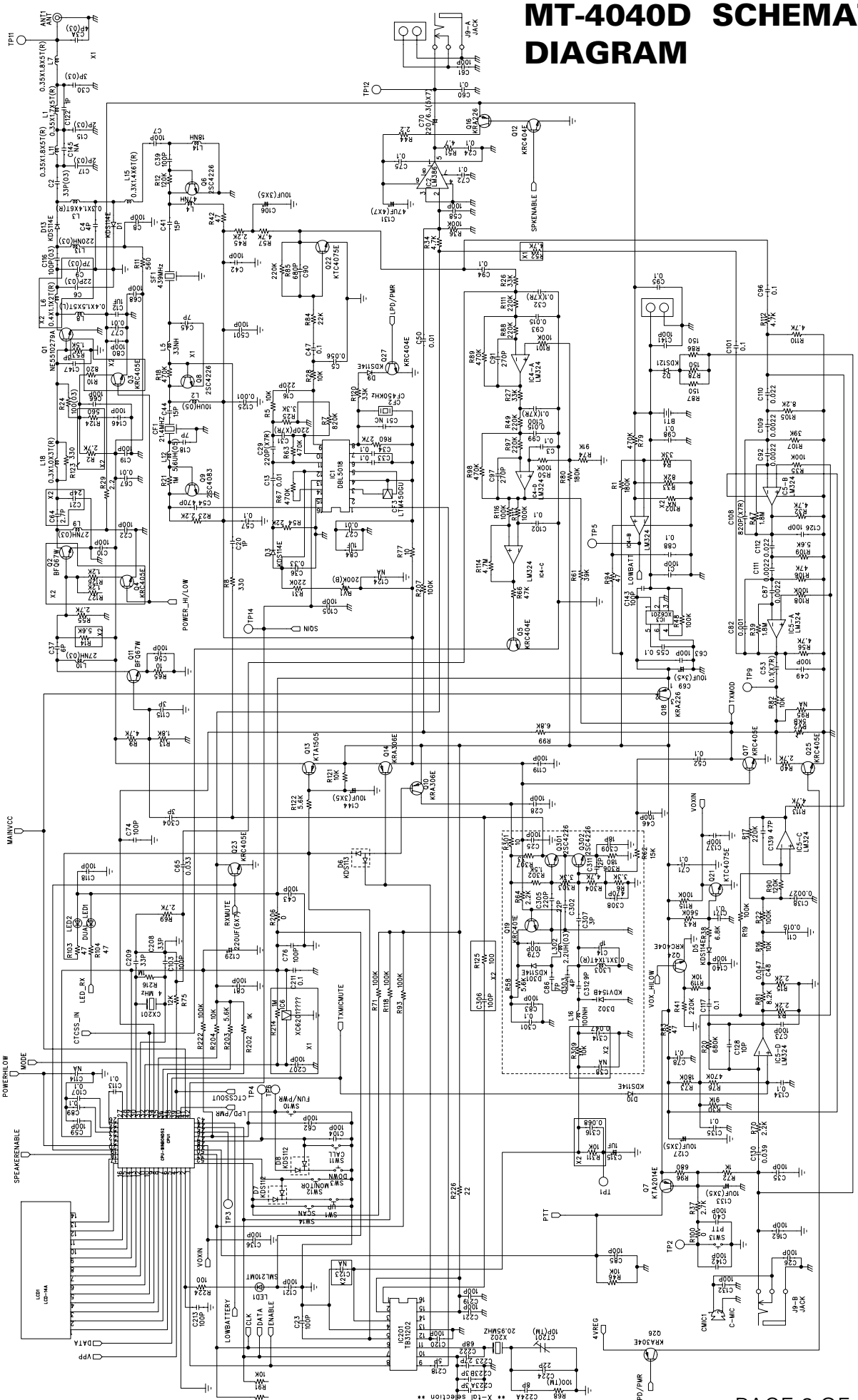
BLOCK DIAGRAM



MT-2020D SCHEMATIC DIAGRAM



MT-4040D SCHEMATIC DIAGRAM



CHANNEL FREQUENCY CHARTS

PMR Frequency Chart

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	446.00625Mhz	2	446.01875Mhz
3	446.03125Mhz	4	446.04375Mhz
5	446.05625Mhz	6	446.06875Mhz
7	446.08125Mhz	8	446.09375Mhz

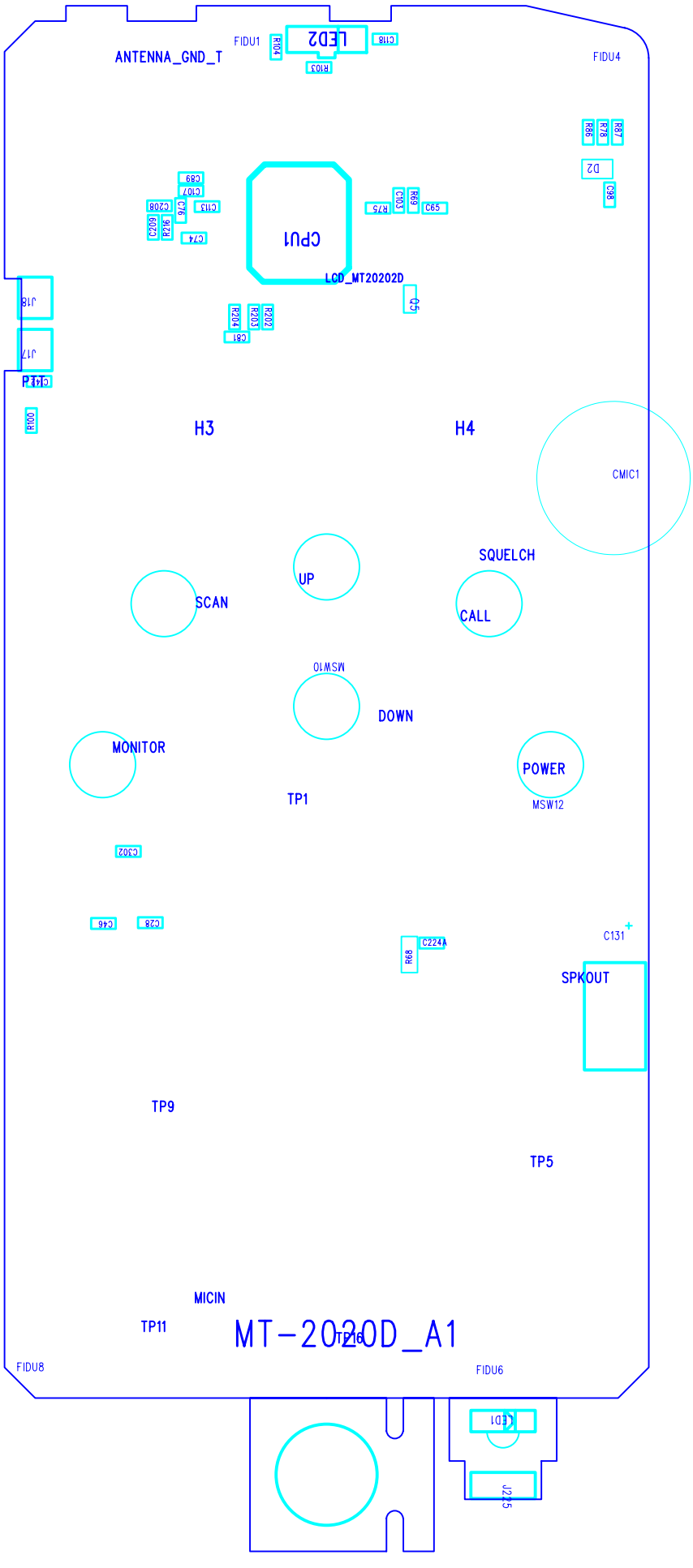
CTCSS Tone Frequency Chart

NO	FREQ.(Hz)	NO	FREQ. (Hz)	NO	FREQ. (Hz)
1	67.0	14	107.2	27	167.9
2	71.9	15	110.9	28	186.2
3	74.4	16	114.8	29	179.9
4	77.0	17	118.8	30	186.2
5	79.7	18	123.0	31	192.8
6	82.5	19	127.3	32	203.5
7	85.4	20	131.8	33	210.7
8	88.5	21	136.5	34	218.1
9	91.5	22	141.3	35	225.7
10	94.8	23	146.2	36	233.6
11	97.4	24	151.4	37	241.8
12	100.0	25	156.7	38	250.3
13	103.5	26	162.2		

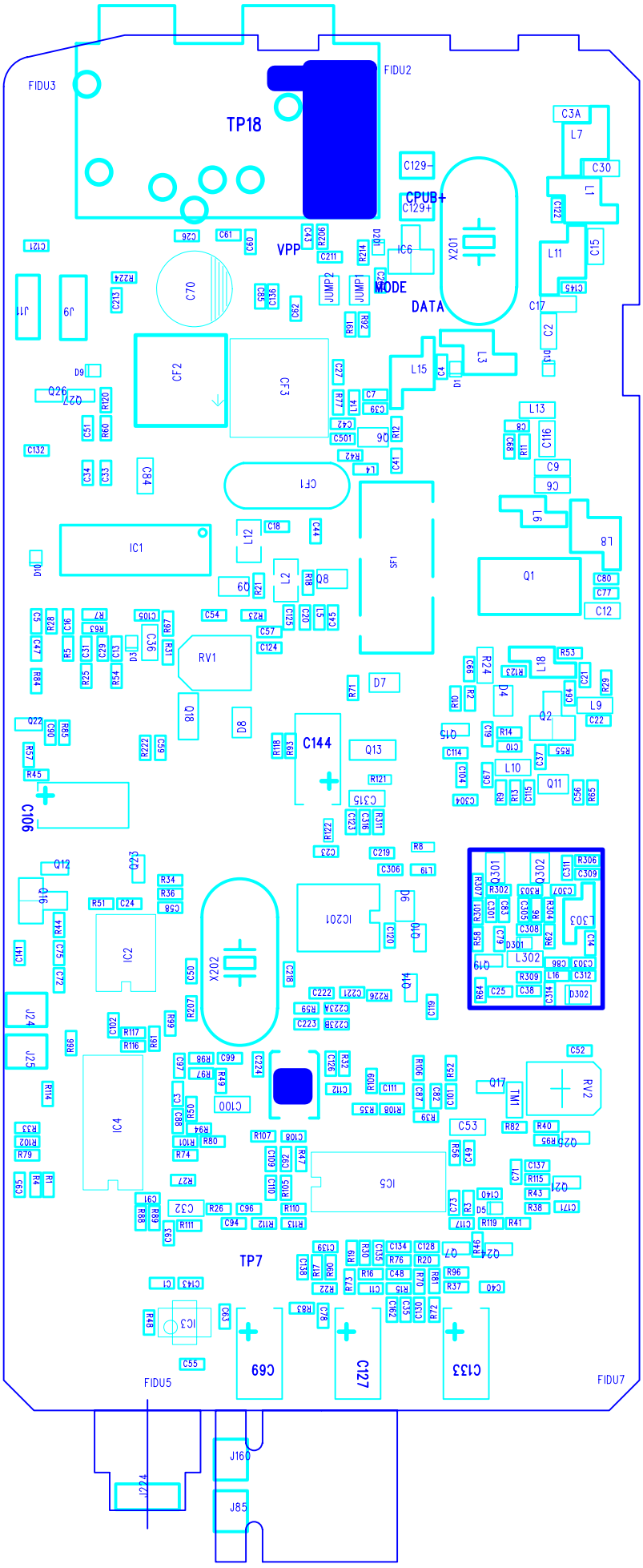
LPD Frequency Chart

Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	433.07500	36	433.95000
02	433.10000	37	433.97500
03	433.12500	38	434.00000
04	433.15000	39	434.02500
05	433.17500	40	434.05000
06	433.20000	41	434.07500
07	433.22500	42	434.10000
08	433.25000	43	434.12500
09	433.27500	44	434.15000
10	433.30000	45	434.17500
11	433.32500	46	434.20000
12	433.35000	47	434.22500
13	433.37500	48	434.25000
14	433.40000	49	434.27500
15	433.42500	50	434.30000
16	433.45000	51	434.32500
17	433.47500	52	434.35000
18	433.50000	53	434.37500
19	433.52500	54	434.40000
20	433.55000	55	434.42500
21	433.57500	56	434.45000
22	433.60000	57	434.47500
23	433.62500	58	434.50000
24	433.65000	59	434.52500
25	433.67500	60	434.55000
26	433.70000	61	434.57500
27	433.72500	62	434.60000
28	433.75000	63	434.62500
29	433.77500	64	434.65000
30	433.80000	65	434.67500
31	433.82500	66	434.70000
32	433.85000	67	434.72500
33	433.87500	68	434.75000
34	433.90000	69	434.77500
35	433.92500		

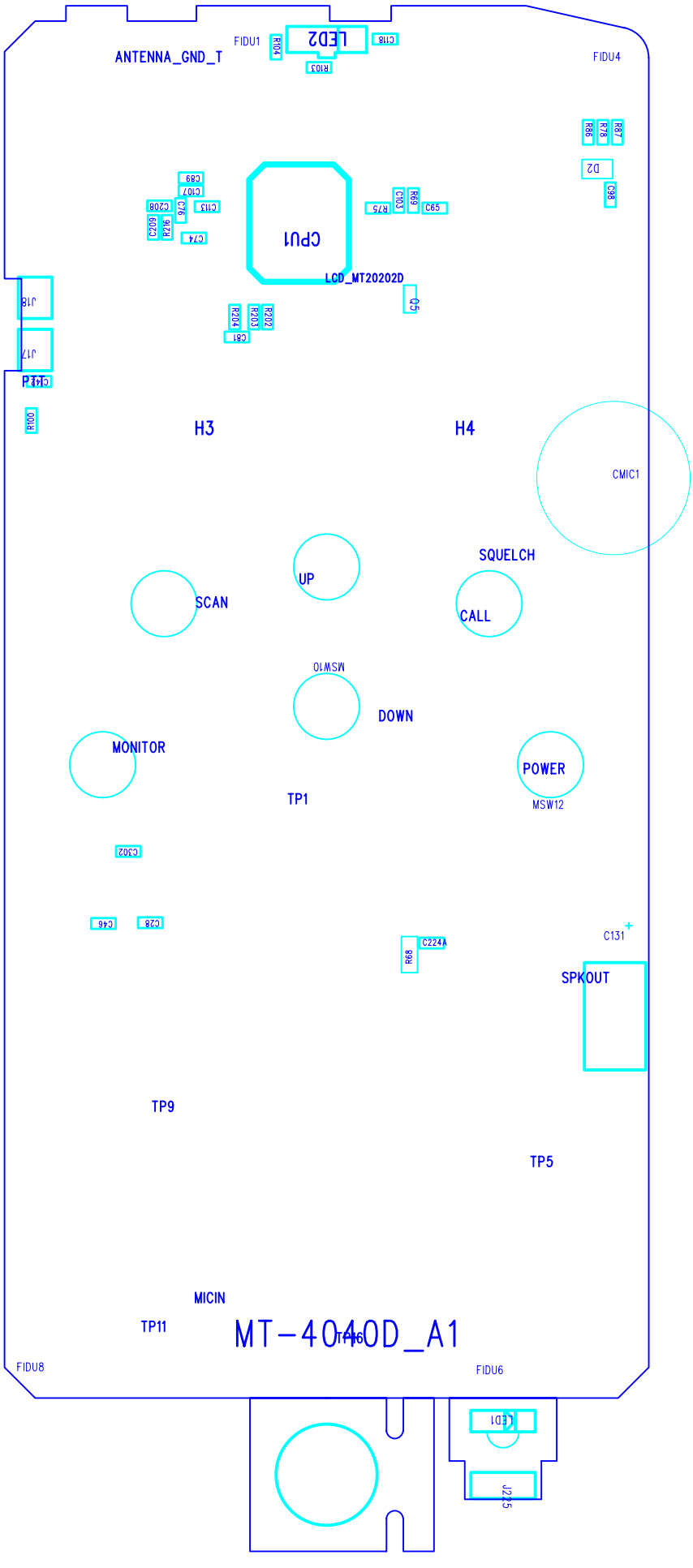
MT-2020D TOP PCB MAP



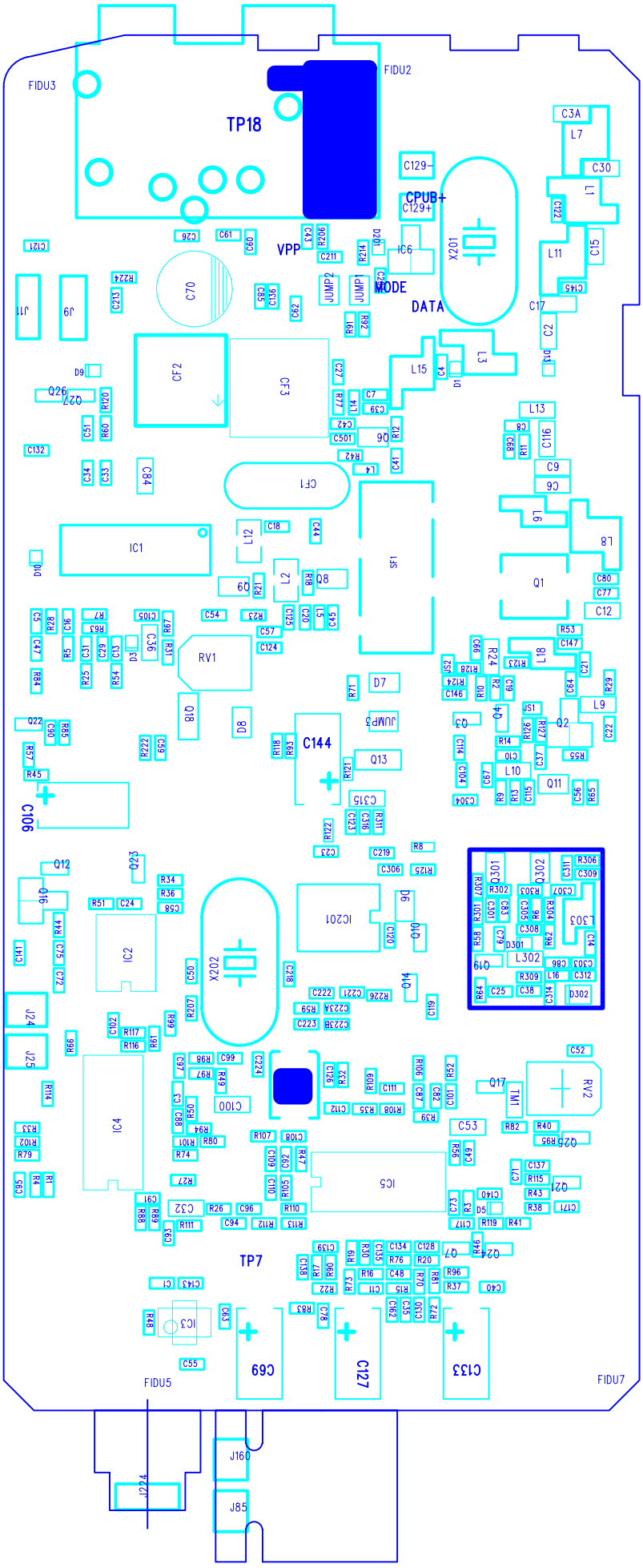
MT-2020D BOTTOM PCB MAP



MT-4040D TOP PCB MAP



MT-4040D BOTTOM PCB MAP



TEST AND ALIGNMENT PROCEDURE

1. RECOMMENDED TEST EQUIPMENT

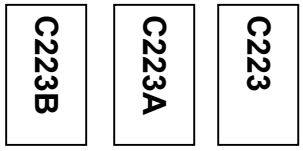
1.1 HP8920A,B Radio Communication Tester or equivalent
1.2 Fluke 187 Digital Voltmeter or equivalent
1.3 HPE3615A Power Supply or equivalent

2. TEST PREPARATION

2.1 Connect a 6.0Vdc power supply to the positive battery terminal input point and the negative battery terminal input point (GND) into the negative terminal.
2.3 Connect the HP8920A,B RF Output port to the ANT point.
2.4 TP12 should be connected to the ***Audio In Hi*** and TP10 should be connected to the ***Audio In Lo*** of the HP8920B.
2.5 Set the unit at Ch1 (**446.00625MHz**)

3. CRYSTAL SELECT

3.1 X202 crystal is marked with red, blue, and no color marking. Matching capacitors **C223, C223A, and C223B** that are in PCB will be determined by the markings and are as follows:



Crystal		C223A	C223B
A	Red	**Connect**	**Connect**
B	NO COLOR	**Connect**	**NC**
C	Blue	**NC**	**NC**

4. VCO ADJUSTMENT

4.1 Set the unit at PMR Ch1 (446.00625MHz) and connect a digital voltmeter to TP1 (VCO PD).
4.2 Press the PTT Button so the unit is in transmit mode.
4.3 ***Adjust L303 until the voltmeter reads around 3.1~3.2Vdc (without VCO Plate). L303 is located under the shieldcan.***
Solder VCO Plate and let temperature stabilize. Recheck TX VCO at Ch1, should be 2.8~3.1Vdc
4.4 Release the PTT switch so the unit will be in Receive mode.
4.5 Observe the voltage at TP1, the voltage should be **2.5~3.2Vdc**.
4.6 Set the unit at PMR Ch8 (446.09375MHz).
4.7 Press the PTT switch so the unit is in transmit mode.
4.8 Observe the voltage at TP1, the voltage should be **2.8~3.2Vdc**.
4.9 Release the PTT switch so the unit will be in receive mode.
4.10 Observe the voltage at TP1, the voltage should be **2.5~3.2Vdc**.
4.11 Set the unit at LPD Ch1 (433.075MHz)
4.12 Press the PTT switch so the unit is in transmit mode.
4.13 Observe the voltage at TP1, the voltage should be **1.0 ~ 1.8Vdc**.
4.14 Release the PTT switch so the unit will be in receive mode.
4.15 Observe the voltage at TP1, the voltage should be **0.9 ~ 1.7Vdc**.

NOTE : Above Specifications are measured with VCO Plate soldered.

5. TRANSMITTER FREQUENCY ALIGNMENT

Equipment Setting:

Filter : 50Hz~15kHz
IF Filter : PMR 15kHz; LPD : 230kHz
De-Emphasis : OFF
Monitor : Pk-Pk/2
Input : 200mVrms; 1kHz Deviation

5.1 Set the unit/equipment for TX Test **(SEE FIGURE 2).** Set the unit at PMR Ch1. Press the PTT button so the unit will be in transmit mode.
5.2 Adjust CT201 trimmer capacitor until such that the output frequency is equal to the channel frequency with maximum error of +/-200Hz **(OQA Limit of +/-800Hz).**
Production will control as follows:
- PCBA Alignment : +/-200Hz
- Casing Test : +/-500Hz
- OQA Limit : +/-800Hz

6. TRANSMITTER OUTPUT POWER CHECK

MT2020D

6.1 Set the unit at PMR Ch1. (use short cable)
6.2 Press the PTT button so the unit is in transmit mode.
6.3 Transmit Power should be between **0.4~1.0W.**
6.4 Set the unit at LPD Ch1.
6.5 Press the PTT button so the unit is in transmit mode. Ensure the TX Power is **10~70mW.**

MT4040D

6.6 Set the Power Supply to 5Vdc. Set the unit at PMR Ch1. (use short cable)
6.7 Press the PTT button so the unit is in transmit mode. Make sure Power Supply is 5Vdc during PTT.
6.8 Transmit Power should be between **1.4~2.5W.**
6.9 **Solder J3**. Press the PTT button so the unit is in transmit mode. Transmit Power should be between **0.4~1.0W.**
6.10 Set the unit at LPD Ch1.
6.11 Press the PTT button so the unit is in transmit mode. Ensure the TX Power is **8~70mW**

7. TRANSMITTER DEVIATION ADJUSTMENT

7.1 Set the unit at PMR Ch1. Connect an audio generator (600ohms) to the microphone terminal pads. The audio frequency should be set at 1kHz with a level of 200mVrms.
7.2 Connect an FM Deviation Meter (on the HP8920B) on ANT point. Set the monitor to read ***(Pk to Pk)/2*** deviation. Set ***Filter 1*** to 50Hz and ***Filter 2*** to 15kHz. ***De-emphasis*** should be set to Off.
7.3 Press the PTT button so the unit will be in transmit mode.
7.4 Adjust RV2 and observe the reading at the Deviation Meter, the reading should be between **1.5** to **1.8kHz (MT2020D)** / between **1.8** to **2.1kHz (MT4040D)**.
7.5 Set the unit to LPD Ch1. Set the monitor to read ***(Pk to Pk)/2*** deviation. Set ***Filter 1*** to 50Hz and ***Filter 2*** to 15kHz. ***De-emphasis*** should be set to Off. Set the **IF Filter** to **230kHz**. Press the PTT button and check the Deviation Meter, the reading should be **2.8 ~ 5.0kHz.**
7.6 At PMR Ch1, decrease the audio generator level until the deviation reads +/-**1.2** kHz. The generator level should be between **3~10mV**
. 7.7 Check that the transmit audio distortion is less than 5%. TX Distortion should be checked at **1.2kHz** Modulation, using Narrowband Filter with De-Emphasis ON.
7.8 Set the CTCSS to Code 1. Turn OFF the audio generator. Press the PTT button so the unit will be in transmit mode.
7.9 Confirm that the CTCSS Code modulation is between 0.4 to 0.7kHz
7.10 Set the CTCSS to Code 38. Press the PTT button so the unit will be in transmit mode.
7.11 Confirm that the CTCSS Code modulation is between 0.4 to 0.7kHz.

8. RECEIVER ALIGNMENT

8.1 Set the unit/equipment for RX Test **(SEE FIGURE 3).** Set the RF Generator level to –47dBm. The generator should be set for 1.5kHz deviation at 1kHz modulation. Set the Impedance at **8ohms**.
8.2 Set ***Filter 1*** to 25Hz and ***Filter 2*** to 15kHz.
8.3 Set the unit at PMR Ch1. Set the **Volume level for 4** (default Level). Align CF2 for maximum level. Check the audio level, should be **0.27~0.6Vrms**
8.4 Confirm that the RX Distortion is less than 5%.
8.5 Reduce the RF Generator signal level until a 12dB Sinad reading is achieved. The RF Generator level should be less than –120dBm.
8.6 Set the RF Generator level to –47dBm, and set the unit Volume Level to maximum.
8.7 Check the maximum Audio Output Level, should be **>1.70Vrms**.
8.8 Set the unit at LPD Channel 1.
8.9 Set the RF generator at 3.0kHz deviation at 1kHz modulation.
8.10 Repeat Procedure 8.5 and confirm that the RF Generator is less than –122dBm at 12dB SINAD.

9. SQUELCH THRESHOLD AND HYSTERISIS

9.1 Set unit same as 8.1.
9.2 Set the RF Generator level until unit is at 2dB Sinad or unit is squelched (RX Off).
9.3 Slowly increase the RF Signal Generator level until the unit un-squelches (RX On), confirm that the sensitivity is between **6~14dB SINAD (PMR Band)**.

10. VOX TEST

10.1 Set the unit into VOX Mode (Level 2). The VOX icon should be displayed on the LCD.
10.2 Connect an audio generator into the microphone terminal. The audio frequency should be set for 1kHz frequency with a level of 0mVrms and the output should be turned off.
10.3 Turn on the output of the audio generator.
10.4 Increase the Audio Generator level until unit goes into TX Mode.
10.5 Check the Generator level, it should be between **0.8 ~ 2.0mV**.

11. LOW BATTERY LEVEL TEST

11.1 Set the unit into standby mode.
11.2 Set the Power Supply voltage to 4.8Vdc.
11.3 Slowly decrease the Power Supply Voltage until the Battery icon appears and blink.
11.4 Observe the Power Supply Level. The level must be between **4.1** to **4.4**Vdc

FIGURE 1 (VCO TEST)

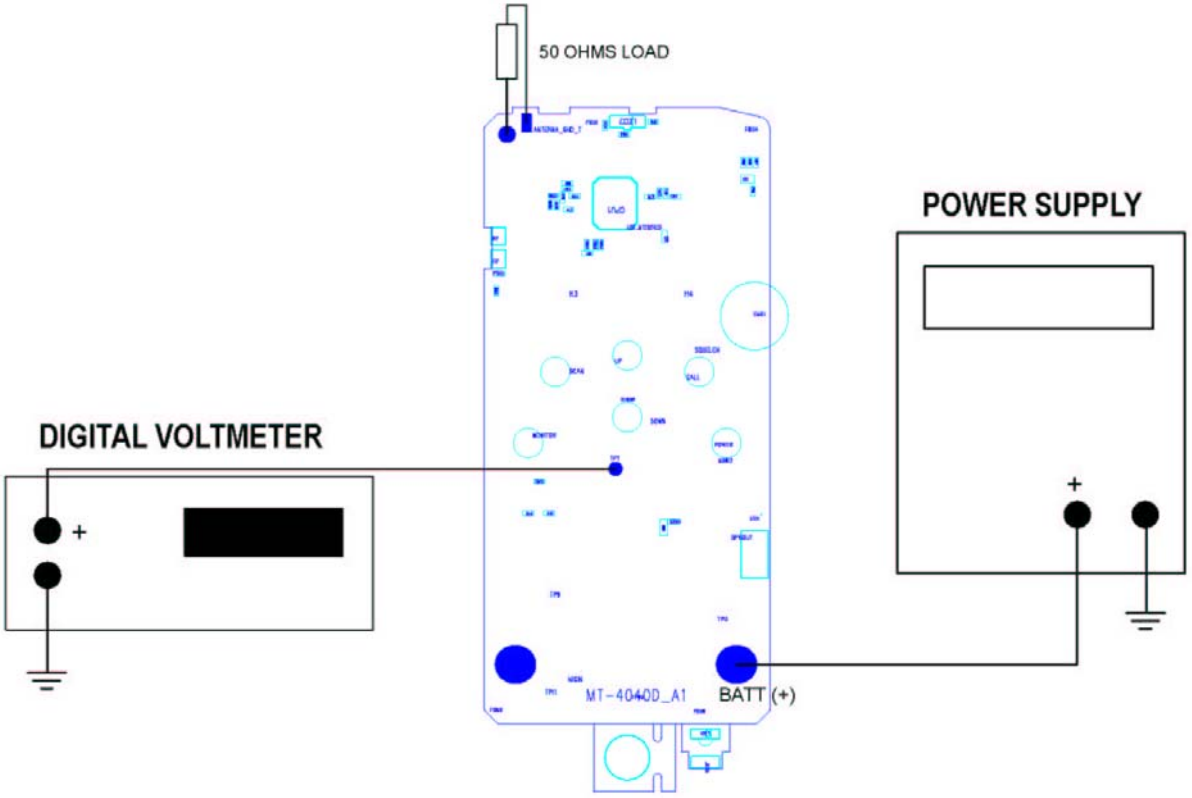


FIGURE 2 (TX TEST)

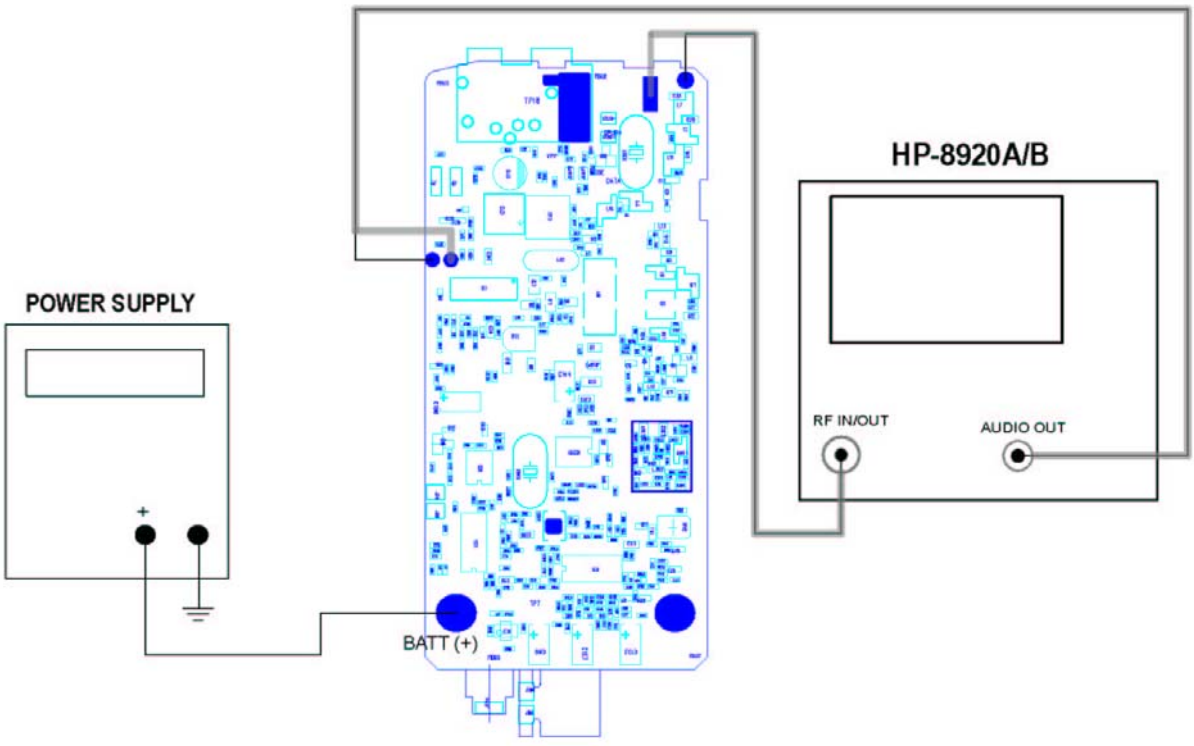
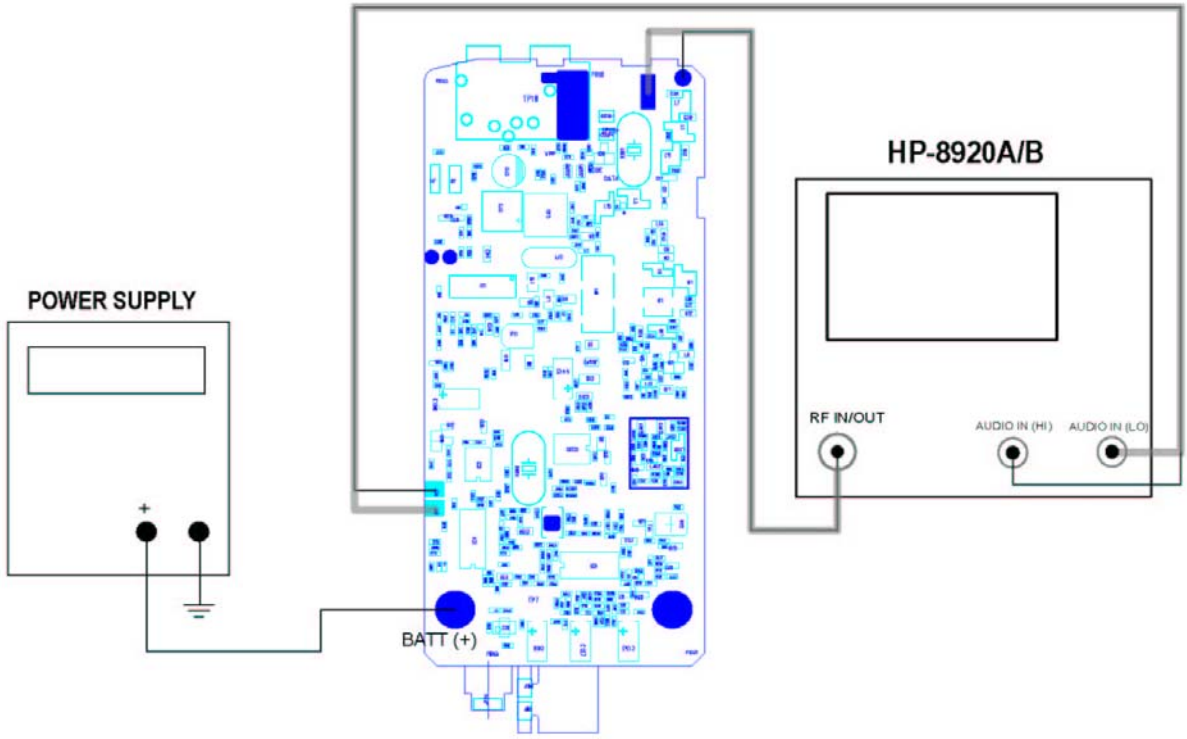


FIGURE 3 (RX TEST)



MT-2020 PARTS LIST

C1	100P	Capacitor Chip NP0 0402	1
C10	100P	Capacitor Chip NP0 0402	1
C100	0.1(X7R)	Capacitor Chip X7R 0603	1
C101	0.1	Capacitor Chip Y5V 0402	1
C102	0.1	Capacitor Chip Y5V 0402	1
C103	100P	Capacitor Chip NP0 0402	1
C104	100P	Capacitor Chip NP0 0402	1
C105	100P	Capacitor Chip NP0 0402	1
C106	10UF(3X5)	Capacitor Elect. 3X5	1
C107	0.1	Capacitor Chip Y5V 0402	1
C108	820P(X7R)	Capacitor Chip X7R 0402	1
C109	0.0022	Capacitor Chip X7R 0402	1
C11	0.0082	Capacitor Chip X7R 0402	1
C110	0.022	Capacitor Chip X7R 0402	1
C111	0.0022	Capacitor Chip X7R 0402	1
C112	0.022	Capacitor Chip X7R 0402	1
C113	0.1	Capacitor Chip Y5V 0402	1
C115	3P	Capacitor Chip NP0 0402	1
C116	100P(03)	Capacitor Ceramic 0603 NP0	1
C117	0.1	Capacitor Chip Y5V 0402	1
C118	100P	Capacitor Chip NP0 0402	1
C119	100P	Capacitor Chip NP0 0402	1
C12	1UF	Capacitor Chip Y5V 0603	1
C120	100P	Capacitor Chip NP0 0402	1
C121	100P	Capacitor Chip NP0 0402	1
C122	1P	Capacitor Chip NP0 0402	1
C123	100P	Capacitor Chip NP0 0402	1
C125	0.001	Capacitor Chip X7R 0402	1
C126	100P	Capacitor Chip NP0 0402	1
C127	10UF(3X5)	Capacitor Elect. 3X5	1
C128	10P	Capacitor Chip NP0 0402	1
C129	100/6.3(5X7)	Capacitor Elect	1
C13	0.01	Capacitor Chip X7R 0402	1
C130	0.039	Capacitor Chip X7R 0402	1
C131	47uF/6.3(4X7)	Capacitor Elect	1
C132	100P	Capacitor Chip NP0 0402	1
C133	10UF(3X5)	Capacitor Elect. 3X5	1
C134	0.1	Capacitor Chip Y5V 0402	1
C135	0.1	Capacitor Chip Y5V 0402	1

C136	100P	Capacitor Chip NP0 0402	1
C137	100P	Capacitor Chip NP0 0402	1
C138	0.0027	Capacitor Chip X7R 0402	1
C139	47P	Capacitor Chip NP0 0402	1
C14	1P	Capacitor Chip NP0 0402	1
C140	100P	Capacitor Chip NP0 0402	1
C141	100P	Capacitor Chip NP0 0402	1
C142	100P	Capacitor Chip NP0 0402	1
C143	100P	Capacitor Chip NP0 0402	1
C144	10UF(3X5)	Capacitor Elect. 3X5	1
C15	2P(03)	Capacitor Ceramic 0603 NP0	1
C16	220P	Capacitor Chip X7R 0402	1
C162	100P	Capacitor Chip NP0 0402	1
C17	2P(03)	Capacitor Ceramic 0603 NP0	1
C171	0.1	Capacitor Chip Y5V 0402	1
C18	7P	Capacitor Chip NP0 0402	1
C19	100P	Capacitor Chip NP0 0402	1
C2	33P(03)	Capacitor Ceramic 0603 NP0	1
C20	1P	Capacitor Chip NP0 0402	1
C207	100P	Capacitor Chip NP0 0402	1
C208	33P	Capacitor Chip NP0 0402	1
C209	33P	Capacitor Chip NP0 0402	1
C21	10P	Capacitor Chip NP0 0402	1
C211	0.1	Capacitor Chip Y5V 0402	1
C213	100P	Capacitor Chip NP0 0402	1
C218	5P	Capacitor Chip NP0 0402	1
C219	100P	Capacitor Chip NP0 0402	1
C22	100P	Capacitor Chip NP0 0402	1
C221	100P	Capacitor Chip NP0 0402	1
C222	68P	Capacitor Chip NP0 0402	1
C223	22P	Capacitor Chip NP0 0402	1
C223A	3P	Capacitor Chip NP0 0402	1
C223B	3P	Capacitor Chip NP0 0402	1
C224	22P	Capacitor Chip NP0 0402	1
C224A	8P	Capacitor Chip NP0 0402	1
C23	100P	Capacitor Chip NP0 0402	1
C24	0.1	Capacitor Chip Y5V 0402	1
C25	100P	Capacitor Chip NP0 0402	1
C26	100P	Capacitor Chip NP0 0402	1
C27	0.01	Capacitor Chip X7R 0402	1
C28	100P	Capacitor Chip NP0 0402	1

C29	220P(X7R)	Capacitor Chip X7R 0402	1
C3	0.1	Capacitor Chip Y5V 0402	1
C30	3P(03)	Capacitor Ceramic 0603 NP0	1
C301	0.1	Capacitor Chip Y5V 0402	1
C302	22P	Capacitor Chip NP0 0402	1
C303	4P	Capacitor Chip NP0 0402	1
C304	3P	Capacitor Chip NP0 0402	1
C305	220P	Capacitor Chip NPO 0402	1
C306	5P	Capacitor Chip NP0 0402	1
C307	3P	Capacitor Chip NP0 0402	1
C308	470P	Capacitor Chip X7R 0402	1
C309	18P	Capacitor Chip NP0 0402	1
C31	220P(X7R)	Capacitor Chip X7R 0402	1
C311	12P	Capacitor Chip NP0 0402	1
C312	9P	Capacitor Chip NP0 0402	1
C314	0.039	Capacitor Chip X7R 0402	1
C315	1UF	Capacitor Chip Y5V 0603	1
C316	0.033	Capacitor Chip Y5V 0402	1
C32	0.1(X7R)	Capacitor Chip X7R 0603	1
C33	0.1	Capacitor Chip Y5V 0402	1
C34	0.1	Capacitor Chip Y5V 0402	1
C35	100P	Capacitor Chip NP0 0402	1
C36	0.33	Capacitor Chip Y5V 0603	1
C37	6P	Capacitor Chip NP0 0402	1
C38	100P	Capacitor Chip NP0 0402	1
C39	100P	Capacitor Chip NP0 0402	1
C3A	4P(03)	Capacitor Ceramic 0603 NP0	1
C4	4P	Capacitor Chip NP0 0402	1
C40	100P	Capacitor Chip NP0 0402	1
C41	15P	Capacitor Chip NP0 0402	1
C42	100P	Capacitor Chip NP0 0402	1
C43	100P	Capacitor Chip NP0 0402	1
C44	15P	Capacitor Chip NP0 0402	1
C45	7P	Capacitor Chip NP0 0402	1
C46	100P	Capacitor Chip NP0 0402	1
C47	0.1	Capacitor Chip Y5V 0402	1
C48	0.047	Capacitor Chip X7R 0402	1
C49	100P	Capacitor Chip NP0 0402	1
C5	0.056	Capacitor Chip X7R 0402	1
C50	0.01	Capacitor Chip X7R 0402	1
C501	100P	Capacitor Chip NP0 0402	1

C52	0.1	Capacitor Chip Y5V 0402	1
C53	0.1(X7R)	Capacitor Chip X7R 0603	1
C54	470P	Capacitor Chip X7R 0402	1
C55	0.1	Capacitor Chip Y5V 0402	1
C56	100P	Capacitor Chip NP0 0402	1
C57	0.1	Capacitor Chip Y5V 0402	1
C58	100P	Capacitor Chip NP0 0402	1
C59	100P	Capacitor Chip NP0 0402	1
C6	6P(03)	Capacitor Ceramic 0603 NP0	1
C60	0.1	Capacitor Chip Y5V 0402	1
C61	100P	Capacitor Chip NP0 0402	1
C62	100P	Capacitor Chip NP0 0402	1
C63	100P	Capacitor Chip NP0 0402	1
C64	7P	Capacitor Chip NP0 0402	1
C65	0.033	Capacitor Chip X7R 0402	1
C66	100P	Capacitor Chip NP0 0402	1
C67	0.01	Capacitor Chip X7R 0402	1
C68	100P	Capacitor Chip NP0 0402	1
C69	10UF(3X5)	Capacitor Elect. 3X5	1
C7	100P	Capacitor Chip NP0 0402	1
C70	220/6.3(6.3X7)	Capacitor Elect	1
C71	0.1	Capacitor Chip Y5V 0402	1
C72	0.1	Capacitor Chip Y5V 0402	1
C73	100P	Capacitor Chip NP0 0402	1
C74	100P	Capacitor Chip NP0 0402	1
C75	0.1	Capacitor Chip Y5V 0402	1
C76	100P	Capacitor Chip NP0 0402	1
C77	0.01	Capacitor Chip X7R 0402	1
C78	0.1	Capacitor Chip Y5V 0402	1
C79	100P	Capacitor Chip NP0 0402	1
C8	100P	Capacitor Chip NP0 0402	1
C80	100P	Capacitor Chip NP0 0402	1
C81	100P	Capacitor Chip NP0 0402	1
C82	0.001	Capacitor Chip X7R 0402	1
C83	100P	Capacitor Chip NP0 0402	1
C84	1UF	Capacitor Chip Y5V 0603	1
C85	100P	Capacitor Chip NP0 0402	1
C86	7P	Capacitor Chip NP0 0402	1
C87	0.0022	Capacitor Chip X7R 0402	1
C88	0.1	Capacitor Chip Y5V 0402	1
C89	0.1	Capacitor Chip Y5V 0402	1

C90	680P	Capacitor Chip X7R 0402	1
C91	270P(NPO)	Capacitor Chip NPO 0402	1
C92	0.0022	Capacitor Chip X7R 0402	1
C93	0.015	Capacitor Chip X7R 0402	1
C94	0.1	Capacitor Chip Y5V 0402	1
C95	0.1	Capacitor Chip Y5V 0402	1
C96	0.1	Capacitor Chip Y5V 0402	1
C97	220P(NPO)	Capacitor Chip NPO 0402	1
C98	0.1	Capacitor Chip Y5V 0402	1
C99	0.015	Capacitor Chip X7R 0402	1
CF1	21.4MHZ	X-tal filter 21.4MHz UM-5	1
CF2	CF450KHz	450KHz IFT 5mm	1
CF3	LTM450GU	Ceramic filter LTM450GU	1
CMIC1	F9745AP342-34	Condensor Mic	1
CPU1	W742S81A-XXXXX	IC CPU	1
CT201	10P (Trimmer) 3 dia	STC3M10-T1	1
CX201	4 MHz X-tal	D4.00C(20pF) HS-49/S	1
D1	KDS114E	Diode Switching	1
D10	KDS114E	Diode Switching	1
D13	KDS114E	Diode Switching	1
D2	KDS121	CHIP DIODE	1
D3	KDS114E	Diode Switching	1
D301	KDS114E	Diode Switching	1
D302	KDV154B	Diode Vari-cap	1
D4	KDS115 (USM)	Diode Chip	1
D5	KDS114E	Diode Switching	1
D6	KDS113E	Diode Switching	1
D7	KDS112	Diode Chip	1
D8	KDS112	Diode Chip	1
D9	KDS114E	Diode Switching	1
IC1	S5018	IC IF	1
IC2	AZ386M	IC Speaker	1
IC201	TB31202	IC PLL	1
IC3	XC6201	IC Regulator 4V	1
IC4	S324	IC OP	1
IC5	S324	IC OP	1
IC6	XC61CN2402MR	2.4Vdc Detector IC	1
J9-A	EXT MIC	Jack Dual LT2510C	1
L1	0.35X1.7X5T(R)	Inductor Air	1
L10	27NH(03)	Inductor Chip 0603	1
L11	0.35X1.8X5T(R)	Inductor Air	1

L12	5.6UH(05)	Inductor Chip 0805	1
L13	220NH(03)	Inductor Chip 0603	1
L14	18NH	Inductor Chip 0402	1
L15	0.3X1.4X6T(R)	Inductor Air	1
L16	100NH	Inductor Chip 0402	1
L18	0.3X1.0X3T(R)	Inductor Air	1
L19	100NH	Inductor Chip 0402	1
L2	10UH(05)	Inductor Chip 0805	1
L3	0.3X1.4X6T(R)	Inductor Air	1
L302	2.2UH(03)	Inductor Chip 0603	1
L303	0.3X1.1X4T(R)	Inductor Air	1
L4	47NH	Inductor Chip 0402	1
L5	33NH	Inductor Chip 0402	1
L6	0.3X1.0X3T(R)	Inductor Air	1
L7	0.35X1.8X5T(R)	Inductor Air	1
L8	0.4X1.5X5T(L)	Inductor Air	1
L9	27NH(03)	Inductor Chip 0603	1
LCD1	LCD	GX-XXXXX	1
LED1	LTST-S320GKT	Diode LED SMT	1
LED2	DUAL_LED	KPBA-3010ESGC	1
PCB1	PCB	4 Layer for MT2020D	1
Q1	THN6601B	Transistor Chip	1
Q10	KRA306E	Transistor BRT	1
Q11	BFQ67W	Transistor Chip	1
Q12	KRC404E	Transistor BRT	1
Q13	KTA1505	Transistor BRT	1
Q14	KRA306E	Transistor BRT	1
Q15	KRA306E	Transistor BRT	1
Q16	KRA226S	Transistor BRT	1
Q17	KRC405E	Transistor BRT	1
Q18	KRA226S	Transistor BRT	1
Q19	KRC401E	Transistor BRT	1
Q2	2SC4226	Transistor Chip	1
Q21	KTC4075E	Transistor Chip	1
Q22	KTC4075E	Transistor Chip	1
Q23	KRC405E	Transistor BRT	1
Q24	KRC404E	Transistor BRT	1
Q25	KRC405E	Transistor BRT	1
Q26	KRA304E	Transistor BRT	1
Q27	KRC404E	Transistor BRT	1
Q301	2SC4226	Transistor Chip	1

Q302	2SC4226	Transistor Chip	1
Q5	KRC404E	Transistor BRT	1
Q6	2SC4226	Transistor Chip	1
Q7	KTA2014E	Transistor Chip	1
Q8	2SC4226	Transistor Chip	1
Q9	2SC4083	Transistor Chip	1
R1	180K 1%	Resistor Chip 0402 1%	1
R10	1K	Resistor Chip 0402	1
R100	0	Resistor Chip 0402	1
R101	100K	Resistor Chip 0402	1
R102	1M	Resistor Chip 0402	1
R103	47	Resistor Chip 0402	1
R104	47	Resistor Chip 0402	1
R105	8.2K	Resistor Chip 0402	1
R106	47K	Resistor Chip 0402	1
R107	39K	Resistor Chip 0402	1
R108	100K	Resistor Chip 0402	1
R109	5.6K	Resistor Chip 0402	1
R11	560	Resistor Chip 0402	1
R110	4.7K	Resistor Chip 0402	1
R111	220K	Resistor Chip 0402	1
R112	4.7K	Resistor Chip 0402	1
R113	4.7K	Resistor Chip 0402	1
R114	4.7M	Resistor Chip 0402	1
R115	100K	Resistor Chip 0402	1
R116	100K	Resistor Chip 0402	1
R117	100K	Resistor Chip 0402	1
R118	100K	Resistor Chip 0402	1
R119	10K	Resistor Chip 0402	1
R12	120K	Resistor Chip 0402	1
R120	33K	Resistor Chip 0402	1
R121	10K	Resistor Chip 0402	1
R122	5.6K	Resistor Chip 0402	1
R123	330	Resistor Chip 0402	1
R13	1.8K	Resistor Chip 0402	1
R14	10K	Resistor Chip 0402	1
R15	2.2K	Resistor Chip 0402	1
R16	10K	Resistor Chip 0402	1
R17	220K	Resistor Chip 0402	1
R18	470K	Resistor Chip 0402	1
R19	100K	Resistor Chip 0402	1

R2	15K	Resistor Chip 0402	1
R20	680K	Resistor Chip 0402	1
R202	1K	Resistor Chip 0402	1
R203	5.6K	Resistor Chip 0402	1
R204	10K	Resistor Chip 0402	1
R206	0	Resistor Chip 0402	1
R207	100K	Resistor Chip 0402	1
R21	1M	Resistor Chip 0402	1
R214	1M	Resistor Chip 0402	1
R216	1M	Resistor Chip 0402	1
R22	100K	Resistor Chip 0402	1
R222	100K	Resistor Chip 0402	1
R224	100	Resistor Chip 0402	1
R226	22	Resistor Chip 0402	1
R23	2.2K	Resistor Chip 0402	1
R24	100(03)	Resistor Chip 0603 +/-5%	1
R25	3.3K	Resistor Chip 0402	1
R26	33K	Resistor Chip 0402	1
R27	33K	Resistor Chip 0402	1
R28	6.8K	Resistor Chip 0402	1
R29	2.2	Resistor Chip 0402	1
R3	2.2K	Resistor Chip 0402	1
R30	91K	Resistor Chip 0402	1
R301	10	Resistor Chip 0402	1
R302	1.5K	Resistor Chip 0402	1
R303	3.3K	Resistor Chip 0402	1
R304	4.7K	Resistor Chip 0402	1
R306	180	Resistor Chip 0402	1
R307	33	Resistor Chip 0402	1
R309	6.8K	Resistor Chip 0402	1
R31	270K	Resistor Chip 0402	1
R311	12K	Resistor Chip 0402	1
R32	4.7K	Resistor Chip 0402	1
R33	82K 1%	Resistor Chip 0402 1%	1
R34	4.7K	Resistor Chip 0402	1
R35	100K	Resistor Chip 0402	1
R36	100K	Resistor Chip 0402	1
R37	2.7K	Resistor Chip 0402	1
R38	8.2K	Resistor Chip 0402	1
R39	1.8M	Resistor Chip 0402	1
R4	33K 1%	Resistor Chip 0402 1%	1

R40	2.7K	Resistor Chip 0402	1
R41	220K	Resistor Chip 0402	1
R42	47	Resistor Chip 0402	1
R43	560K	Resistor Chip 0402	1
R44	2.2	Resistor Chip 0402	1
R45	2.2K	Resistor Chip 0402	1
R46	10K	Resistor Chip 0402	1
R47	1.8M	Resistor Chip 0402	1
R48	100K	Resistor Chip 0402	1
R49	220K	Resistor Chip 0402	1
R5	10K	Resistor Chip 0402	1
R50	100K	Resistor Chip 0402	1
R51	4.7	Resistor Chip 0402	1
R52	4.7K	Resistor Chip 0402	1
R54	22K	Resistor Chip 0402	1
R55	2.7K	Resistor Chip 0402	1
R56	4.7K	Resistor Chip 0402	1
R57	2.2K	Resistor Chip 0402	1
R58	5.6K	Resistor Chip 0402	1
R59	10K	Resistor Chip 0402	1
R6	3.3K	Resistor Chip 0402	1
R60	27K	Resistor Chip 0402	1
R61	27K	Resistor Chip 0402	1
R62	15K	Resistor Chip 0402	1
R63	470K	Resistor Chip 0402	1
R64	2.2K	Resistor Chip 0402	1
R65	10	Resistor Chip 0402	1
R66	47K	Resistor Chip 0402	1
R67	470K	Resistor Chip 0402	1
R68	100(TM)	NSM3101J280J3Z	1
R69	2.7K	Resistor Chip 0402	1
R7	820K	Resistor Chip 0402	1
R70	2.2K	Resistor Chip 0402	1
R71	100K	Resistor Chip 0402	1
R72	1K	Resistor Chip 0402	1
R73	180K	Resistor Chip 0402	1
R74	91K	Resistor Chip 0402	1
R75	12K	Resistor Chip 0402	1
R76	470K	Resistor Chip 0402	1
R77	10	Resistor Chip 0402	1
R78	150	Resistor Chip 0402	1

R79	470K 1%	Resistor Chip 0402 1%	1
R8	330	Resistor Chip 0402	1
R80	180K	Resistor Chip 0402	1
R81	8.2K	Resistor Chip 0402	1
R82	10K	Resistor Chip 0402	1
R83	47	Resistor Chip 0402	1
R84	22K	Resistor Chip 0402	1
R85	220K	Resistor Chip 0402	1
R86	150	Resistor Chip 0402	1
R87	150	Resistor Chip 0402	1
R88	220K	Resistor Chip 0402	1
R89	470K	Resistor Chip 0402	1
R9	4.7K	Resistor Chip 0402	1
R90	120K	Resistor Chip 0402	1
R91	10K	Resistor Chip 0402	1
R92	10K	Resistor Chip 0402	1
R93	100K	Resistor Chip 0402	1
R94	47	Resistor Chip 0402	1
R96	680	Resistor Chip 0402	1
R97	220K	Resistor Chip 0402	1
R98	470K	Resistor Chip 0402	1
R99	6.8K	Resistor Chip 0402	1
RV1	220KB	Semi-fixed resistor 3 dia	1
RV2	4.7KB	Semi-fixed resistor 3 dia	1
SF1	439MHz (HDF-440DS)	SAW filter F-11SMD type	1
SPK1	Speaker (MD36B-858)	Speaker 36dia 8ohm	1
X202	20.95MHZ X-tal	DA20.950TF(16pF) HC-49/S	1

MT-4040 PARTS LIST

C1	100P	Capacitor Chip NP0 0402	1
C10	100P	Capacitor Chip NP0 0402	1
C100	0.1(X7R)	Capacitor Chip X7R 0603	1
C101	0.1	Capacitor Chip Y5V 0402	1
C102	0.1	Capacitor Chip Y5V 0402	1
C103	100P	Capacitor Chip NP0 0402	1
C104	100P	Capacitor Chip NP0 0402	1
C105	100P	Capacitor Chip NP0 0402	1
C106	10UF(3X5)	Capacitor Elect. 3X5	1
C107	0.1	Capacitor Chip Y5V 0402	1
C108	820P(X7R)	Capacitor Chip X7R 0402	1
C109	0.0022	Capacitor Chip X7R 0402	1
C11	**0.0082**	Capacitor Chip X7R 0402	1
C110	0.022	Capacitor Chip X7R 0402	1
C111	0.0022	Capacitor Chip X7R 0402	1
C112	0.022	Capacitor Chip X7R 0402	1
C113	0.1	Capacitor Chip Y5V 0402	1
C115	3P	Capacitor Chip NP0 0402	1
C116	100P(03)	Capacitor Ceramic 0603 NP0	1
C117	0.1	Capacitor Chip Y5V 0402	1
C118	100P	Capacitor Chip NP0 0402	1
C119	100P	Capacitor Chip NP0 0402	1
C12	1UF	Capacitor Chip Y5V 0603	1
C120	100P	Capacitor Chip NP0 0402	1
C121	100P	Capacitor Chip NP0 0402	1
C122	1P	Capacitor Chip NP0 0402	1
C125	0.001	Capacitor Chip X7R 0402	1
C126	100P	Capacitor Chip NP0 0402	1
C127	10UF(3X5)	Capacitor Elect. 3X5	1
C128	10P	Capacitor Chip NP0 0402	1
C129	**100/6.3(5X7)**	Capacitor Elect	1
C13	0.01	Capacitor Chip X7R 0402	1
C130	0.039	Capacitor Chip X7R 0402	1
C131	47uF/6.3(4X7)	Capacitor Elect	1
C132	100P	Capacitor Chip NP0 0402	1
C133	10UF(3X5)	Capacitor Elect. 3X5	1
C134	0.1	Capacitor Chip Y5V 0402	1
C135	0.1	Capacitor Chip Y5V 0402	1
C136	100P	Capacitor Chip NP0 0402	1

C137	100P	Capacitor Chip NP0 0402	1
C138	0.0027	Capacitor Chip X7R 0402	1
C139	47P	Capacitor Chip NP0 0402	1
C14	1P	Capacitor Chip NP0 0402	1
C140	100P	Capacitor Chip NP0 0402	1
C141	100P	Capacitor Chip NP0 0402	1
C142	100P	Capacitor Chip NP0 0402	1
C143	100P	Capacitor Chip NP0 0402	1
C144	10UF(3X5)	Capacitor Elect. 3X5	1
C146	100P	Capacitor Chip NP0 0402	1
C147	3P	Capacitor Chip NP0 0402	1
C15	2P(03)	Capacitor Ceramic 0603 NP0	1
C16	220P	Capacitor Chip X7R 0402	1
C162	100P	Capacitor Chip NP0 0402	1
C17	2P(03)	Capacitor Ceramic 0603 NP0	1
C171	0.1	Capacitor Chip Y5V 0402	1
C18	7P	Capacitor Chip NP0 0402	1
C19	100P	Capacitor Chip NP0 0402	1
C2	33P(03)	Capacitor Ceramic 0603 NP0	1
C20	1P	Capacitor Chip NP0 0402	1
C207	100P	Capacitor Chip NP0 0402	1
C208	33P	Capacitor Chip NP0 0402	1
C209	33P	Capacitor Chip NP0 0402	1
C21	**24P**	Capacitor Chip NP0 0402	1
C211	0.1	Capacitor Chip Y5V 0402	1
C213	100P	Capacitor Chip NP0 0402	1
C218	5P	Capacitor Chip NP0 0402	1
C219	100P	Capacitor Chip NP0 0402	1
C22	100P	Capacitor Chip NP0 0402	1
C221	100P	Capacitor Chip NP0 0402	1
C222	68P	Capacitor Chip NP0 0402	1
C223	**22P**	Capacitor Chip NP0 0402	1
C223A	3P	Capacitor Chip NP0 0402	1
C223B	3P	Capacitor Chip NP0 0402	1
C224	22P	Capacitor Chip NP0 0402	1
C224A	8P	Capacitor Chip NP0 0402	1
C23	100P	Capacitor Chip NP0 0402	1
C24	0.1	Capacitor Chip Y5V 0402	1
C25	100P	Capacitor Chip NP0 0402	1
C26	100P	Capacitor Chip NP0 0402	1
C27	0.01	Capacitor Chip X7R 0402	1

C28	100P	Capacitor Chip NP0 0402	1
C29	220P(X7R)	Capacitor Chip X7R 0402	1
C3	0.1	Capacitor Chip Y5V 0402	1
C30	3P(03)	Capacitor Ceramic 0603 NP0	1
C301	0.1	Capacitor Chip Y5V 0402	1
C302	22P	Capacitor Chip NP0 0402	1
C303	4P	Capacitor Chip NP0 0402	1
C304	3P	Capacitor Chip NP0 0402	1
C305	220P	Capacitor Chip NPO 0402	1
C306	**100P**	Capacitor Chip NP0 0402	1
C307	3P	Capacitor Chip NP0 0402	1
C308	470P	Capacitor Chip X7R 0402	1
C309	18P	Capacitor Chip NP0 0402	1
C31	220P(X7R)	Capacitor Chip X7R 0402	1
C311	12P	Capacitor Chip NP0 0402	1
C312	9P	Capacitor Chip NP0 0402	1
C314	**0.047**	Capacitor Chip X7R 0402	1
C315	1UF	Capacitor Chip Y5V 0603	1
C316	**0.068**	Capacitor Chip Y5V 0402	1
C32	0.1(X7R)	Capacitor Chip X7R 0603	1
C33	0.1	Capacitor Chip Y5V 0402	1
C34	0.1	Capacitor Chip Y5V 0402	1
C35	100P	Capacitor Chip NP0 0402	1
C36	0.33	Capacitor Chip Y5V 0603	1
C37	6P	Capacitor Chip NP0 0402	1
C39	100P	Capacitor Chip NP0 0402	1
C3A	4P(03)	Capacitor Ceramic 0603 NP0	1
C4	4P	Capacitor Chip NP0 0402	1
C40	100P	Capacitor Chip NP0 0402	1
C41	15P	Capacitor Chip NP0 0402	1
C42	100P	Capacitor Chip NP0 0402	1
C43	100P	Capacitor Chip NP0 0402	1
C44	15P	Capacitor Chip NP0 0402	1
C45	7P	Capacitor Chip NP0 0402	1
C46	100P	Capacitor Chip NP0 0402	1
C47	0.1	Capacitor Chip Y5V 0402	1
C48	0.047	Capacitor Chip X7R 0402	1
C49	100P	Capacitor Chip NP0 0402	1
C5	0.056	Capacitor Chip X7R 0402	1
C50	0.01	Capacitor Chip X7R 0402	1
C501	100P	Capacitor Chip NP0 0402	1

C52	0.1	Capacitor Chip Y5V 0402	1
C53	0.1(X7R)	Capacitor Chip X7R 0603	1
C54	470P	Capacitor Chip X7R 0402	1
C55	0.1	Capacitor Chip Y5V 0402	1
C56	100P	Capacitor Chip NP0 0402	1
C57	0.1	Capacitor Chip Y5V 0402	1
C58	100P	Capacitor Chip NP0 0402	1
C59	100P	Capacitor Chip NP0 0402	1
C6	**22P(03)**	Capacitor Ceramic 0603 NP0	1
C60	0.1	Capacitor Chip Y5V 0402	1
C61	100P	Capacitor Chip NP0 0402	1
C62	100P	Capacitor Chip NP0 0402	1
C63	100P	Capacitor Chip NP0 0402	1
C64	**2.7P**	Capacitor Chip NP0 0402	1
C65	0.033	Capacitor Chip X7R 0402	1
C66	100P	Capacitor Chip NP0 0402	1
C67	0.01	Capacitor Chip X7R 0402	1
C68	100P	Capacitor Chip NP0 0402	1
C69	10UF(3X5)	Capacitor Elect. 3X5	1
C7	100P	Capacitor Chip NP0 0402	1
C70	220/6.3(6.3X7)	Capacitor Elect	1
C71	0.1	Capacitor Chip Y5V 0402	1
C72	0.1	Capacitor Chip Y5V 0402	1
C73	100P	Capacitor Chip NP0 0402	1
C74	100P	Capacitor Chip NP0 0402	1
C75	0.1	Capacitor Chip Y5V 0402	1
C76	100P	Capacitor Chip NP0 0402	1
C77	0.01	Capacitor Chip X7R 0402	1
C78	0.1	Capacitor Chip Y5V 0402	1
C79	100P	Capacitor Chip NP0 0402	1
C8	100P	Capacitor Chip NP0 0402	1
C80	100P	Capacitor Chip NP0 0402	1
C81	100P	Capacitor Chip NP0 0402	1
C82	0.001	Capacitor Chip X7R 0402	1
C83	100P	Capacitor Chip NP0 0402	1
C84	1UF	Capacitor Chip Y5V 0603	1
C85	100P	Capacitor Chip NP0 0402	1
C86	7P	Capacitor Chip NP0 0402	1
C87	0.0022	Capacitor Chip X7R 0402	1
C88	0.1	Capacitor Chip Y5V 0402	1
C89	0.1	Capacitor Chip Y5V 0402	1

C9	**7P(03)**	Capacitor Ceramic 0603 NP0	1
C90	680P	Capacitor Chip X7R 0402	1
C91	270P(NPO)	Capacitor Chip NPO 0402	1
C92	0.0022	Capacitor Chip X7R 0402	1
C93	0.015	Capacitor Chip X7R 0402	1
C94	0.1	Capacitor Chip Y5V 0402	1
C95	0.1	Capacitor Chip Y5V 0402	1
C96	0.1	Capacitor Chip Y5V 0402	1
C97	**220P(NPO)**	Capacitor Chip NPO 0402	1
C98	0.1	Capacitor Chip Y5V 0402	1
C99	0.015	Capacitor Chip X7R 0402	1
CF1	21.4MHZ	X-tal filter 21.4MHz UM-5	1
CF2	CF450KHz	450KHz IFT 5mm	1
CF3	LTM450GU	Ceramic filter LTM450GU	1
CMIC1	F9745AP342-34	Condensor Mic	1
CPU1	W742S81A-XXXXX	IC CPU	1
CT201	10P (Trimmer) 3 dia	STC3M10-T1	1
CX201	4 MHz X-tal	D4.00C(20pF) HS-49/S	1
D1	KDS114E	Diode Switching	1
D10	KDS114E	Diode Switching	1
D13	KDS114E	Diode Switching	1
D2	KDS121	CHIP DIODE	1
D3	KDS114E	Diode Switching	1
D301	KDS114E	Diode Switching	1
D302	KDV154B	Diode Vari-cap	1
D5	KDS114E	Diode Switching	1
D6	KDS113E	Diode Switching	1
D7	KDS112	Diode Chip	1
D8	KDS112	Diode Chip	1
D9	KDS114E	Diode Switching	1
IC1	S5018	IC IF	1
IC2	AZ386M	IC Speaker	1
IC201	TB31202	IC PLL	1
IC3	XC6201	IC Regulator 4V	1
IC4	S324	IC OP	1
IC5	S324	IC OP	1
IC6	XC61CN2402MR	2.4Vdc Detector IC	1
J9-A	EXT MIC	Jack Dual LT2510C	1
L1	0.35X1.7X5T(R)	Inductor Air	1
L10	27NH(03)	Inductor Chip 0603	1
L11	0.35X1.8X5T(R)	Inductor Air	1

L12	5.6UH(05)	Inductor Chip 0805	1
L13	220NH(03)	Inductor Chip 0603	1
L14	18NH	Inductor Chip 0402	1
L15	0.3X1.4X6T(R)	Inductor Air	1
L16	100NH	Inductor Chip 0402	1
L18	0.3X1.0X3T(R)	Inductor Air	1
L2	10UH(05)	Inductor Chip 0805	1
L3	0.3X1.4X6T(R)	Inductor Air	1
L302	2.2UH(03)	Inductor Chip 0603	1
L303	0.3X1.1X4T(R)	Inductor Air	1
L4	47NH	Inductor Chip 0402	1
L5	33NH	Inductor Chip 0402	1
L6	**0.4X1.1X2T(R)**	Inductor Air	1
L7	0.35X1.8X5T(R)	Inductor Air	1
L8	0.4X1.5X5T(L)	Inductor Air	1
L9	27NH(03)	Inductor Chip 0603	1
LCD1	LCD	GX-XXXXX	1
LED1	LTST-S320GKT	Diode LED SMT	1
LED2	DUAL_LED	KPBA-3010ESGC	1
PCB1	PCB	4 Layer for MT4040D	1
Q1	NE5510279A	Transistor Chip	1
Q10	KRA306E	Transistor BRT	1
Q11	BFQ67W	Transistor Chip	1
Q12	KRC404E	Transistor BRT	1
Q13	KTA1505S	Transistor BRT	1
Q14	KRA306E	Transistor BRT	1
Q16	KRA226S	Transistor BRT	1
Q17	KRC405E	Transistor BRT	1
Q18	KRA226S	Transistor BRT	1
Q19	KRC401E	Transistor BRT	1
Q2	**BFQ67W**	Transistor Chip	1
Q21	KTC4075E	Transistor Chip	1
Q22	KTC4075E	Transistor Chip	1
Q23	KRC405E	Transistor BRT	1
Q24	KRC404E	Transistor BRT	1
Q25	KRC405E	Transistor BRT	1
Q26	KRA304E	Transistor BRT	1
Q27	KRC404E	Transistor BRT	1
Q3	**KRC405E**	**Transistor BRT**	**1**
Q301	2SC4226	Transistor Chip	1
Q302	2SC4226	Transistor Chip	1

Q4	**KRC405E**	**Transistor BRT**	**1**
Q5	KRC404E	Transistor BRT	1
Q6	2SC4226	Transistor Chip	1
Q7	KTA2014E	Transistor Chip	1
Q8	2SC4226	Transistor Chip	1
Q9	2SC4083	Transistor Chip	1
R1	180K 1%	Resistor Chip 0402 1%	1
R10	**820**	Resistor Chip 0402	1
R100	0	Resistor Chip 0402	1
R101	100K	Resistor Chip 0402	1
R102	**2.2M**	**Resistor Chip 0402**	**1**
R103	47	Resistor Chip 0402	1
R104	47	Resistor Chip 0402	1
R105	8.2K	Resistor Chip 0402	1
R106	47K	Resistor Chip 0402	1
R107	39K	Resistor Chip 0402	1
R108	100K	Resistor Chip 0402	1
R109	5.6K	Resistor Chip 0402	1
R11	560	Resistor Chip 0402	1
R110	4.7K	Resistor Chip 0402	1
R111	220K	Resistor Chip 0402	1
R112	4.7K	Resistor Chip 0402	1
R113	4.7K	Resistor Chip 0402	1
R114	4.7M	Resistor Chip 0402	1
R115	100K	Resistor Chip 0402	1
R116	100K	Resistor Chip 0402	1
R117	100K	Resistor Chip 0402	1
R118	100K	Resistor Chip 0402	1
R119	10K	Resistor Chip 0402	1
R12	120K	Resistor Chip 0402	1
R120	33K	Resistor Chip 0402	1
R121	10K	Resistor Chip 0402	1
R122	5.6K	Resistor Chip 0402	1
R123	330	Resistor Chip 0402	1
R124	**560**	Resistor Chip 0402	1
R125	**100**	Resistor Chip 0402	1
R126	**1K**	Resistor Chip 0402	1
R127	**3.3K**	Resistor Chip 0402	1
R128	**820**	Resistor Chip 0402	1
R13	1.8K	Resistor Chip 0402	1
R14	**5.6K**	Resistor Chip 0402	1

R15	2.2K	Resistor Chip 0402	1
R16	10K	Resistor Chip 0402	1
R17	220K	Resistor Chip 0402	1
R18	470K	Resistor Chip 0402	1
R19	100K	Resistor Chip 0402	1
R2	**2.7K**	Resistor Chip 0402	1
R20	680K	Resistor Chip 0402	1
R202	1K	Resistor Chip 0402	1
R203	5.6K	Resistor Chip 0402	1
R204	10K	Resistor Chip 0402	1
R206	0	Resistor Chip 0402	1
R207	100K	Resistor Chip 0402	1
R21	1M	Resistor Chip 0402	1
R214	1M	Resistor Chip 0402	1
R216	1M	Resistor Chip 0402	1
R22	100K	Resistor Chip 0402	1
R222	100K	Resistor Chip 0402	1
R224	100	Resistor Chip 0402	1
R226	22	Resistor Chip 0402	1
R23	2.2K	Resistor Chip 0402	1
R24	100(03)	Resistor Chip 0603 +/-5%	1
R25	3.3K	Resistor Chip 0402	1
R26	33K	Resistor Chip 0402	1
R27	33K	Resistor Chip 0402	1
R28	**6.8K**	Resistor Chip 0402	1
R29	2.2	Resistor Chip 0402	1
R3	2.2K	Resistor Chip 0402	1
R30	91K	Resistor Chip 0402	1
R301	10	Resistor Chip 0402	1
R302	1.5K	Resistor Chip 0402	1
R303	3.3K	Resistor Chip 0402	1
R304	4.7K	Resistor Chip 0402	1
R306	180	Resistor Chip 0402	1
R307	33	Resistor Chip 0402	1
R309	**10K**	Resistor Chip 0402	1
R31	**270K**	Resistor Chip 0402	1
R311	**10K**	Resistor Chip 0402	1
R32	4.7K	Resistor Chip 0402	1
R33	82K 1%	Resistor Chip 0402 1%	1
R34	4.7K	Resistor Chip 0402	1
R35	100K	Resistor Chip 0402	1

R36	100K	Resistor Chip 0402	1
R37	2.7K	Resistor Chip 0402	1
R38	**8.2K**	Resistor Chip 0402	1
R39	1.8M	Resistor Chip 0402	1
R4	33K 1%	Resistor Chip 0402 1%	1
R40	2.7K	Resistor Chip 0402	1
R41	220K	Resistor Chip 0402	1
R42	47	Resistor Chip 0402	1
R43	560K	Resistor Chip 0402	1
R44	2.2	Resistor Chip 0402	1
R45	2.2K	Resistor Chip 0402	1
R46	10K	Resistor Chip 0402	1
R47	1.8M	Resistor Chip 0402	1
R48	100K	Resistor Chip 0402	1
R49	220K	Resistor Chip 0402	1
R5	10K	Resistor Chip 0402	1
R50	100K	Resistor Chip 0402	1
R51	4.7	Resistor Chip 0402	1
R52	4.7K	Resistor Chip 0402	1
R53	**1.5K**	Resistor Chip 0402	1
R54	22K	Resistor Chip 0402	1
R55	2.7K	Resistor Chip 0402	1
R56	4.7K	Resistor Chip 0402	1
R57	**2.2K**	Resistor Chip 0402	1
R58	5.6K	Resistor Chip 0402	1
R59	10K	Resistor Chip 0402	1
R6	3.3K	Resistor Chip 0402	1
R60	27K	Resistor Chip 0402	1
R61	**27K**	Resistor Chip 0402	1
R62	15K	Resistor Chip 0402	1
R63	470K	Resistor Chip 0402	1
R64	2.2K	Resistor Chip 0402	1
R65	10	Resistor Chip 0402	1
R66	47K	Resistor Chip 0402	1
R67	470K	Resistor Chip 0402	1
R68	100(TM)	NSM3101J280J3Z	1
R69	2.7K	Resistor Chip 0402	1
R7	820K	Resistor Chip 0402	1
R70	2.2K	Resistor Chip 0402	1
R71	100K	Resistor Chip 0402	1
R72	1K	Resistor Chip 0402	1

R73	180K	Resistor Chip 0402	1
R74	91K	Resistor Chip 0402	1
R75	12K	Resistor Chip 0402	1
R76	470K	Resistor Chip 0402	1
R77	10	Resistor Chip 0402	1
R78	150	Resistor Chip 0402	1
R79	470K 1%	Resistor Chip 0402 1%	1
R8	330	Resistor Chip 0402	1
R80	180K	Resistor Chip 0402	1
R81	8.2K	Resistor Chip 0402	1
R82	10K	Resistor Chip 0402	1
R83	47	Resistor Chip 0402	1
R84	22K	Resistor Chip 0402	1
R85	220K	Resistor Chip 0402	1
R86	150	Resistor Chip 0402	1
R87	150	Resistor Chip 0402	1
R88	220K	Resistor Chip 0402	1
R89	470K	Resistor Chip 0402	1
R9	4.7K	Resistor Chip 0402	1
R90	120K	Resistor Chip 0402	1
R91	10K	Resistor Chip 0402	1
R92	10K	Resistor Chip 0402	1
R93	100K	Resistor Chip 0402	1
R94	47	Resistor Chip 0402	1
R96	680	Resistor Chip 0402	1
R97	220K	Resistor Chip 0402	1
R98	470K	Resistor Chip 0402	1
R99	**3.9K**	Resistor Chip 0402	1
RV1	220KB	Semi-fixed resistor 3 dia	1
RV2	4.7KB	Semi-fixed resistor 3 dia	1
SF1	439MHz (HDF-440DS)	SAW filter F-11SMD type	1
SPK1	Speaker (MD36B-858)	Speaker 36dia 8ohm	1
X202	20.95MHZ X-tal	DA20.950TF(16pF) HC-49/S	1

MT-4040 SEMICONDUCTOR VOLTAGE CHART

1. ICs

	PIN	RX			PIN	TX	RX		PIN	TX	RX
	1	3.70			1	3.20	3.00		1	1.38	1.57
	2	3.10			2	3.90	3.80		2	1.38	1.57
	3	3.50			3	3.90	3.80		3	1.38	1.57
	4	3.80			4	0.00	0.00		4	3.8	0.00
IC1	5	3.30		IC201	5	2.00	3.80	IC5	5	1.30	3.40
	6	3.30			6	0.00	0.00		6	1.38	2.30
S5018	7	3.30		TB31202	7	0.00	0.00	S324	7	1.38	2.30
	8	3.80			8	0.00	0.00		8	1.38	2.30
	9	1.30			9	2.80	2.70		9	1.38	1.52
	10	0.88			10	2.90	2.90		10	1.38	1.52
	11	1.45			11	3.70	3.70		11	0.00	0.00
	12	0.52			12	4.00	0.39		12	1.38	1.52
	13	3.60			13	0.00	0.00		13	1.38	1.52
	14	0.00			14	0.30	0.00		14	1.38	1.52
	15	0.00			15	3.80	3.80				
	16	1.68			16	3.30	3.20				

	PIN	TX	RX		IC 2	RX			PIN	
	1	1.39	1.32		1	1.30			1	4.00
	2	1.39	1.32		2	0.00			2	0.00
	3	1.39	1.32		3	0.00			3	6.00
	4	3.80	0.00		4	0.00			4	6.00
IC4	5	1.40	1.30	IC2	5	2.70		IC3	5	0.00
	6	1.40	1.30		6	6.00			6	0.00
S324	7	1.40	1.30	UTC	7	3.00		XC		
	8	2.80	1.30	34119	8	1.30		6201		
	9	1.40	1.30						PIN	
	10	1.40	1.30					IC6	1	4.00
	11	0.00	0.00						2	0.00
	12	1.00	1.00					XC61CN	3	4.00
	13	0.60	0.60					2402MR		
	14	2.80	2.80							

2. CPU

	PIN	TX	RX	PIN	TX	RX
	1	0.50	0.00	**27**	1.70	2.30
	2	3.00	4.00	**28**	0.00	0.00
	3	0.00	0.00	**29**	0.00	0.00
	4	0.00	0.00	**30**	2.00	2.00
	5	0.00	0.00	**31**	2.00	2.00
	6	1.50	2.00	**32**	4.00	4.00
	7	1.50	2.00	**33**	0.10	2.00
	8	1.50	2.00	**34**	0.50	0.00
CPU1	**9**	1.50	2.00	**35**	1.50	0.00
	10	1.50	2.00	**36**	1.50	0.00
W742	**11**	1.50	2.00	**37**	1.50	0.00
E81A	**12**	1.50	2.00	**38**	1.50	4.00
	13	1.50	2.00	**39**	0.50	2.00
	14	1.50	2.00	**40**	0.30	4.00
	15	1.50	2.00	**41**	4.00	4.00
	16	1.50	2.00	**42**	0.00	0.60
	17	1.50	2.00	**43**	2.70	2.70
	18	1.50	2.00	**44**	0.20	0.00
	19	0.50	4.00	**45**	NC	NC
	20	2.00	0.00	**46**	3.80	3.80
	21	NC	NC	**47**	4.00	2.00
	22	NC	NC	**48**	0.20	0.00
	23	NC	NC	**49**	4.00	0.00
	24	2.00	2.50	**50**	0.60	0.00
	25	1.00	1.30	**51**	4.00	4.00
	26	0.80	1.00	**52**	1.50	4.00

3. DIODE

	PIN	TX	RX		PIN	TX	RX
D1	**A**	0.90	0.00	**D9**	**A**	0.00	3.80
KDS114E	**K**	0.00	0.00	**KDS114E**	**K**	0.00	3.30
D13	**A**	1.20	0.00	**D5**	**A**	0.80	0.60
KDS114E	**K**	0.60	0.00	**KDS114E**	**K**	0.30	0.10
D2	**K**	6.00	6.00	**D6**	**A**	4.00	0.4
KDS121	**A1**	0.00	0.00	**KDS113E**	**K1**	2.00	4.00
	A2	0.00	0.00		**K2**	2.70	1.10
D10	**A**	0.00	4.00	**D7**	**K**	4.00	4.00
KDS114E	**K**	1.36	3.40	**KDS112**	**A1**	4.00	4.00
					A2	4.00	4.00
D3	**A**	0.00	0.50	**D8**	**K**	4.00	4.00
KDS114E	**K**	0.00	0.00	**KDS112**	**A1**	4.00	4.00
					A2	4.00	4.00
D301	**A**	0.00	1.50				
KDS114E	**K**	4.00	0.50				
D302	**A**	0.00	0.00				
KDV154B	**K**	4.00	1.30				

3. TRANSISTOR

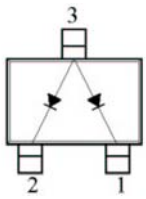
	PIN	TX	RX		PIN	TX	RX
Q1(H/L)	E	0.00	0.00	Q23	E	0.00	0.00
NE5510279A	B	0.2/0.2	0.00	KRC405E	B	3.50	3.20
	C	5.60	5.60		C	0.00	0.00
Q10	E	4.00	4.00	Q24	E	0.00	0.00
KRA306E	B	2.70	1.10	KRC404E	B	0.20	0.00
	C	3.90	3.80		C	0.00	0.00
Q11	E	0.35	0.00	Q25(PMR/LPD)	E	0.00	0.00
BFQ67W	B	1.00	0.00	KRC405E	B	4.2/0.2	0/3.9
	C	3.78	0.00		C	3.5/4.4	0.00
Q12	E	0.00	0.00	Q26(PMR/LPD)	E	4.3/4.1	4.0/4.0
KRC404E	B	0.00	4.00	KRA304E	B	0.4/4.1	4.0/0
	C	6.00	0.10		C	4.1/0	0/4.0
Q13	E	4.00	4.00	Q27	E	0.00	0.00
KTA1505S	B	3.30	3.90	KRC404E	B	4.00	0.00
	C	4.00	0.00		C	0.00	3.30
Q14	E	4.00	4.00	Q8	E	0.00	0.00
KRA306E	B	4.00	0.40	2SC4226	B	0.00	0.70
	C	0.00	3.90		C	0.00	3.80
Q22	E	0.00	0.00	Q3 (H/L)	E	0.00	0.00
KTC4075E	B	0.00	0.50	KRC405E	B	0.15/3.7	0/3.5
	C	0.00	1.40		C	0.1/0.2	0.00
Q16	E	6.00	6.00	Q301	E	2.80	2.50
KRA226S	B	6.00	0.10	2SC4226	B	3.30	3.20
	C	0.60	6.00		C	3.60	3.50
Q17	E	0.00	0.00	Q302	E	1.10	0.90
KRC405E	B	0.00	3.80	2SC4226	B	1.50	1.60
	C	0.35	0.00		C	3.00	1.60
Q18	E	4.30	4.00	Q4 (H/L)	E	0.00	0.00
KRA226S	B	0.40	0.10	KRC405E	B	0.12/3.56	0/3.5
	C	4.30	4.00		C	0.4/0.12	0.00
Q19	E	0.00	0.00	Q5	E	0.00	0.00
KRC401E	B	0.00	1.30	KRC404E	B	1.74	0.80
	C	3.80	0.55		C	0.00	2.00
Q2 (H/L)	E	0.00	0.00	Q6	E	0.00	0.00
BFQ67W	B	0.58/0.48	0.00	2SC4226	B	0.00	0.75
	C	5.80	0.00		C	0.00	3.60
Q9	E	0.00	0.00	Q7	E	4.20	4.00
2SC4083	B	0.00	0.70	KTA2014E	B	3.50	3.70
	C	0.00	3.80		C	4.20	0.00
Q21	E	0.00	0.00				
KTC4075E	B	4.1	0.00				
	C	0.30	0.00				

SEMICONDUCTOR LEAD ASSIGNMENT AND BLOCK DIAGRAM

A. DIODE

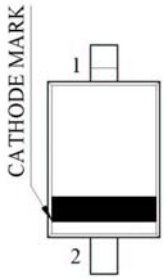
1. KDS113 : VHF TUNER BAND SWITCH APPLICATION

1. CATHODE 1
2. CATHODE 2
3. ANODE



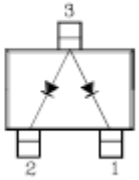
2. KDS114E : VHF TUNER BAND SWITCH APPLICATION

1. ANODE
2. CATHODE



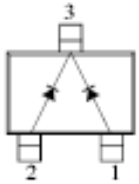
3. KDS120 : ULTRA HIGH SPEED SWITCHING APPLICATION

1. CATHODE 1
2. CATHODE 2
3. ANODE



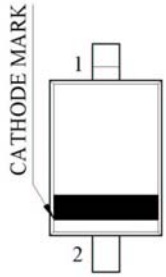
4. KDS121 : ULTRA HIGH SPEED SWITCHING APPLICATION

1. ANODE 1
2. ANODE 2
3. CATHODE



5. KDV154B : VHF,UHF TUNER AFC VCO FOR UHF BAND RADIO

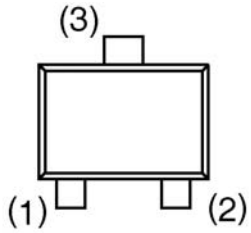
1. ANODE
2. CATHODE



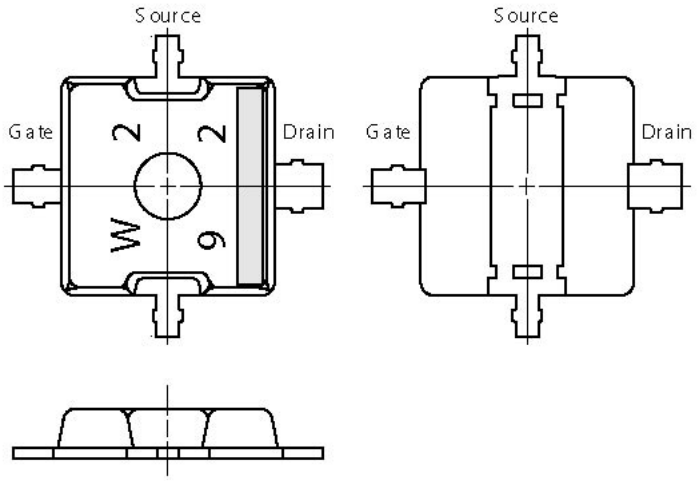
B. TRANSISTOR

1. KRA306E : SWITCHING APPLICATION. INTERFACE CIRCUIT AND DRIVER CIRCUIT APPLICATION.
2. 2SC4083 : HIGH FREQUENCY AMPLIFIER.
3. KRC404E : SWITCHING APPLICATION. INTERFACE CIRCUIT AND DRIVER CIRCUIT APPLICATION.
4. KRC405E : SWITCHING APPLICATION. INTERFACE CIRCUIT AND DRIVER CIRCUIT APPLICATION.
5. KRC401E : SWITCHING APPLICATION. INTERFACE CIRCUIT AND DRIVER CIRCUIT APPLICATION.
6. KRA226S : HIGH CURRENT SWITCHING APPLICATION.
7. KTA1505S : GENERAL PURPOSE SWITCHING APPLICATION.
8. KTA2014E : GENERAL PURPOSE SWITCHING APPLICATION.
9. 2SC4226 : HIGH FREQUENCY LOW NOISE AMPLIFIER.

(1) Base
(2) Emitter
(3) Collector

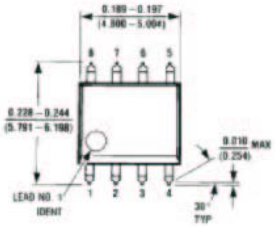


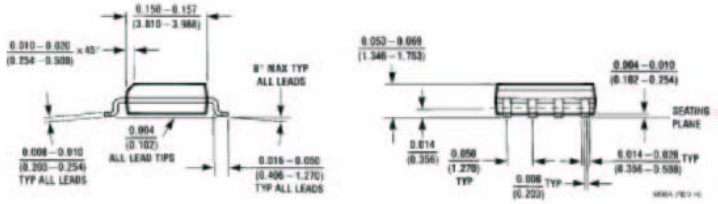
10. NE5510279A : SILICON POWER MOS FET

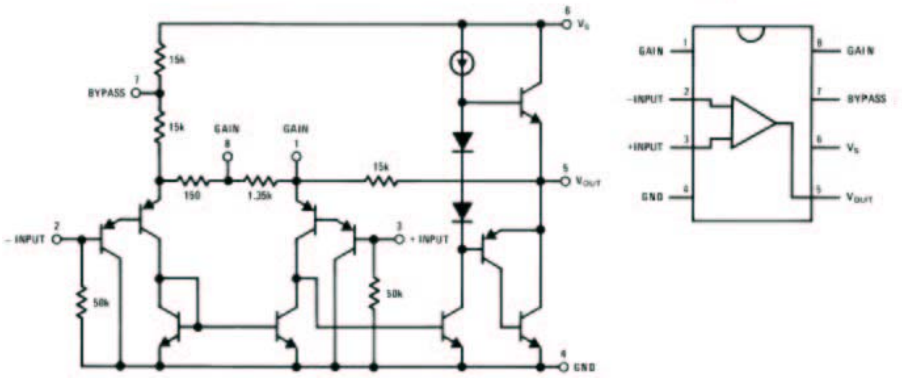


B. IC

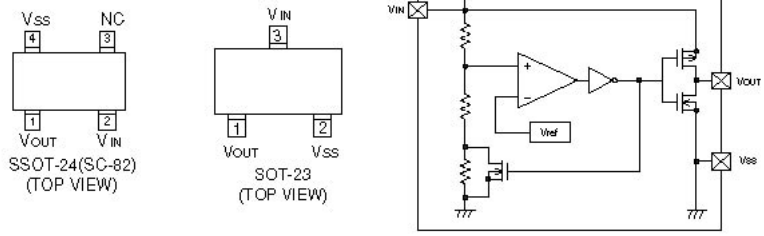
1. AZ386 LOW VOLTAGE AUDIO AMPLIFIER



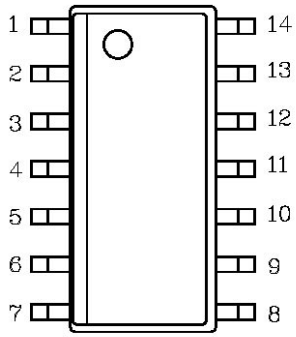




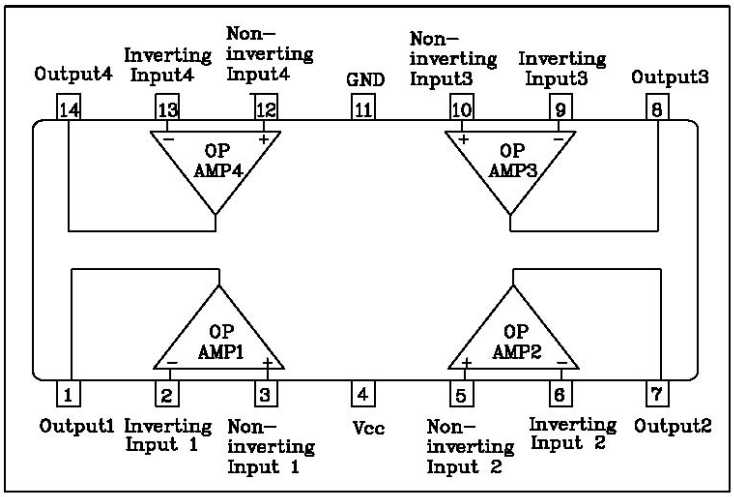
2. XC61N2402MR STANDARD VOLTAGE DETECTOR



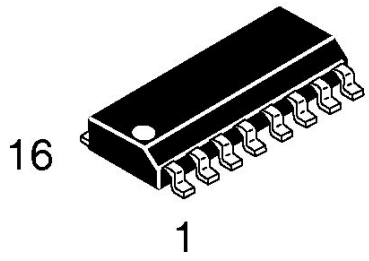
2. S324



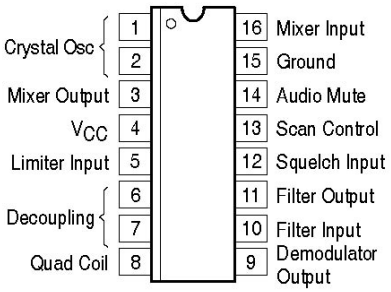
Block Diagram



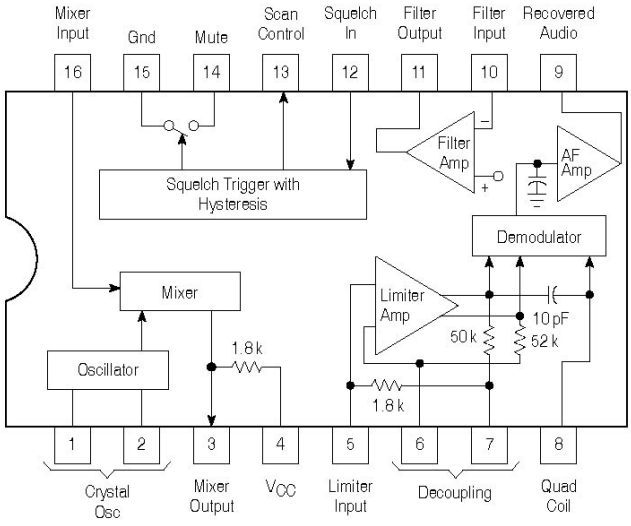
3. 35018



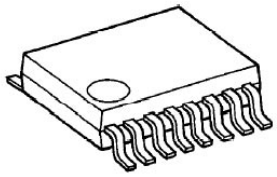
PIN CONNECTIONS

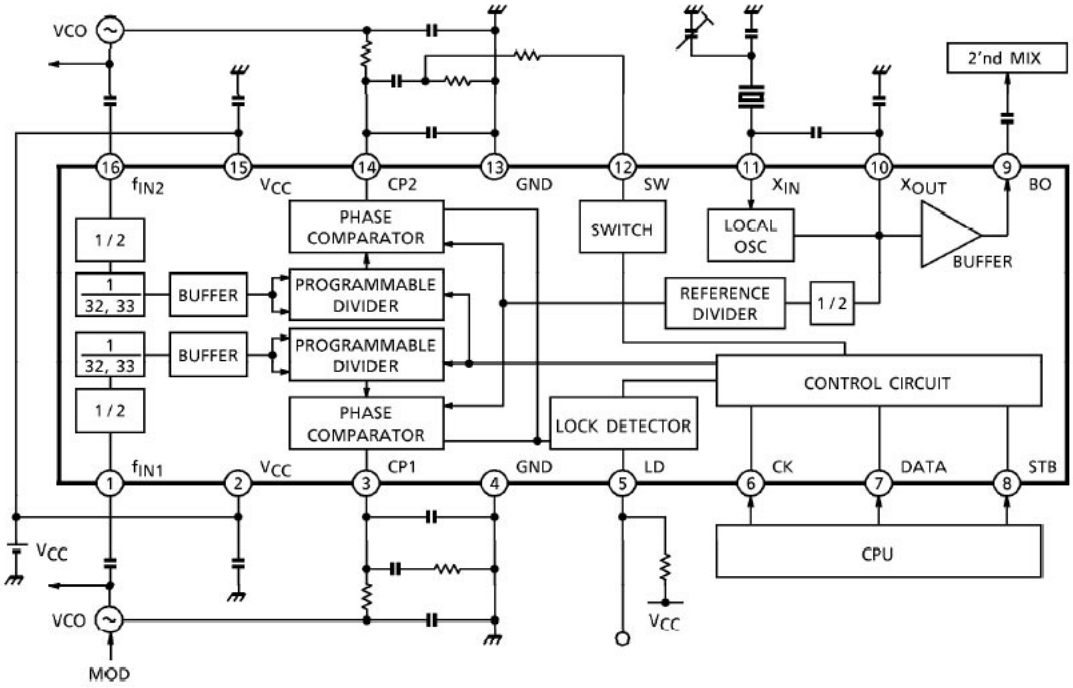


(Top View)

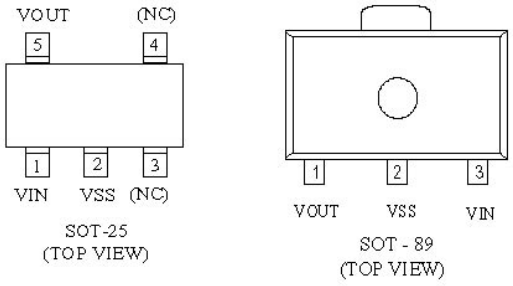


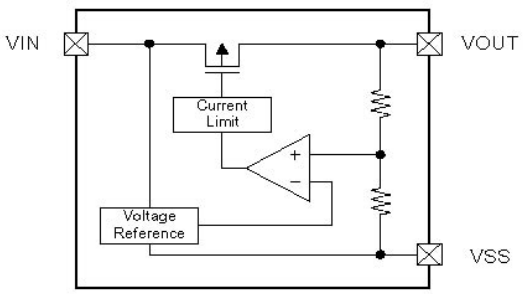
4. TB32102



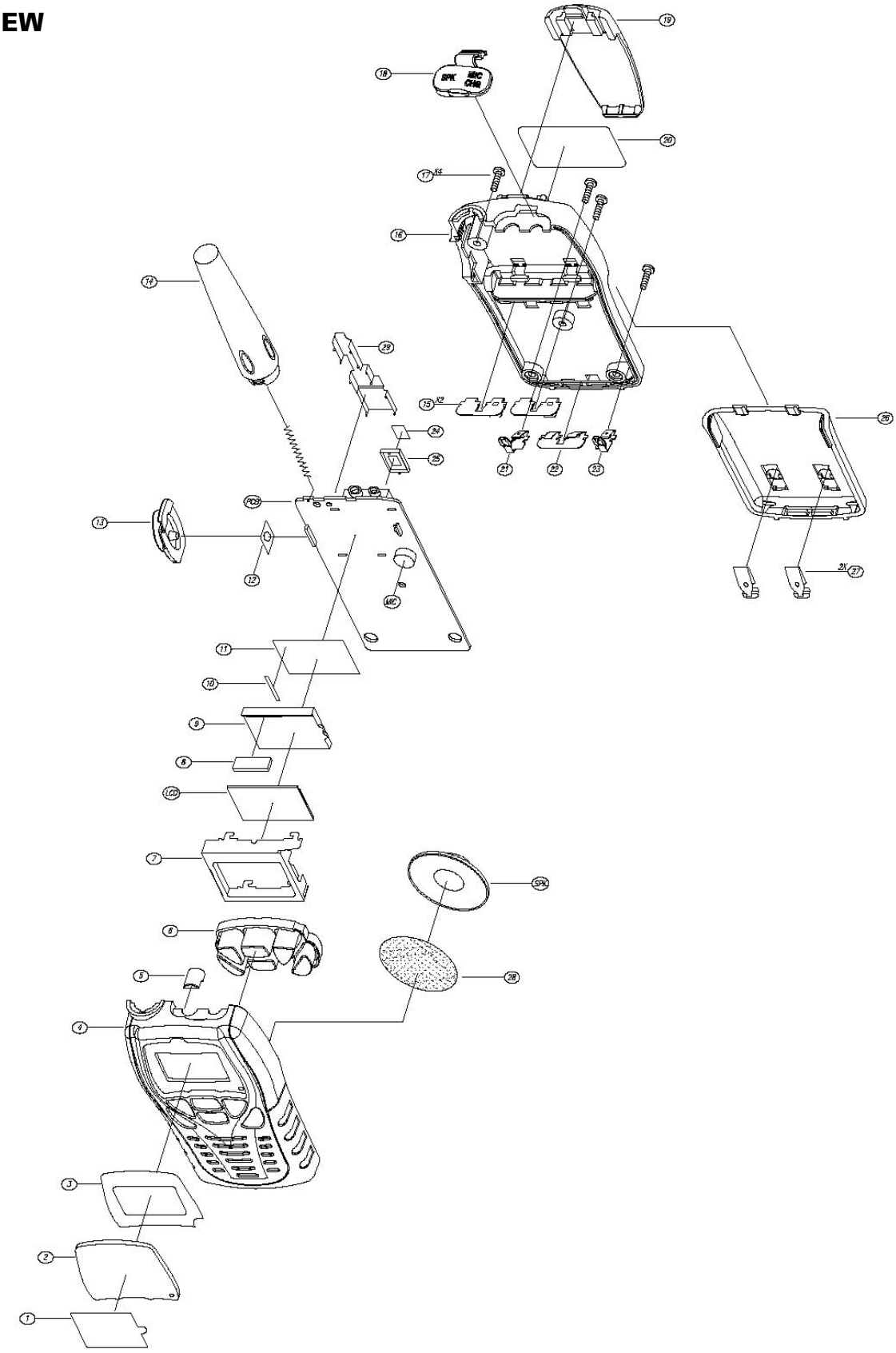


5. XC201





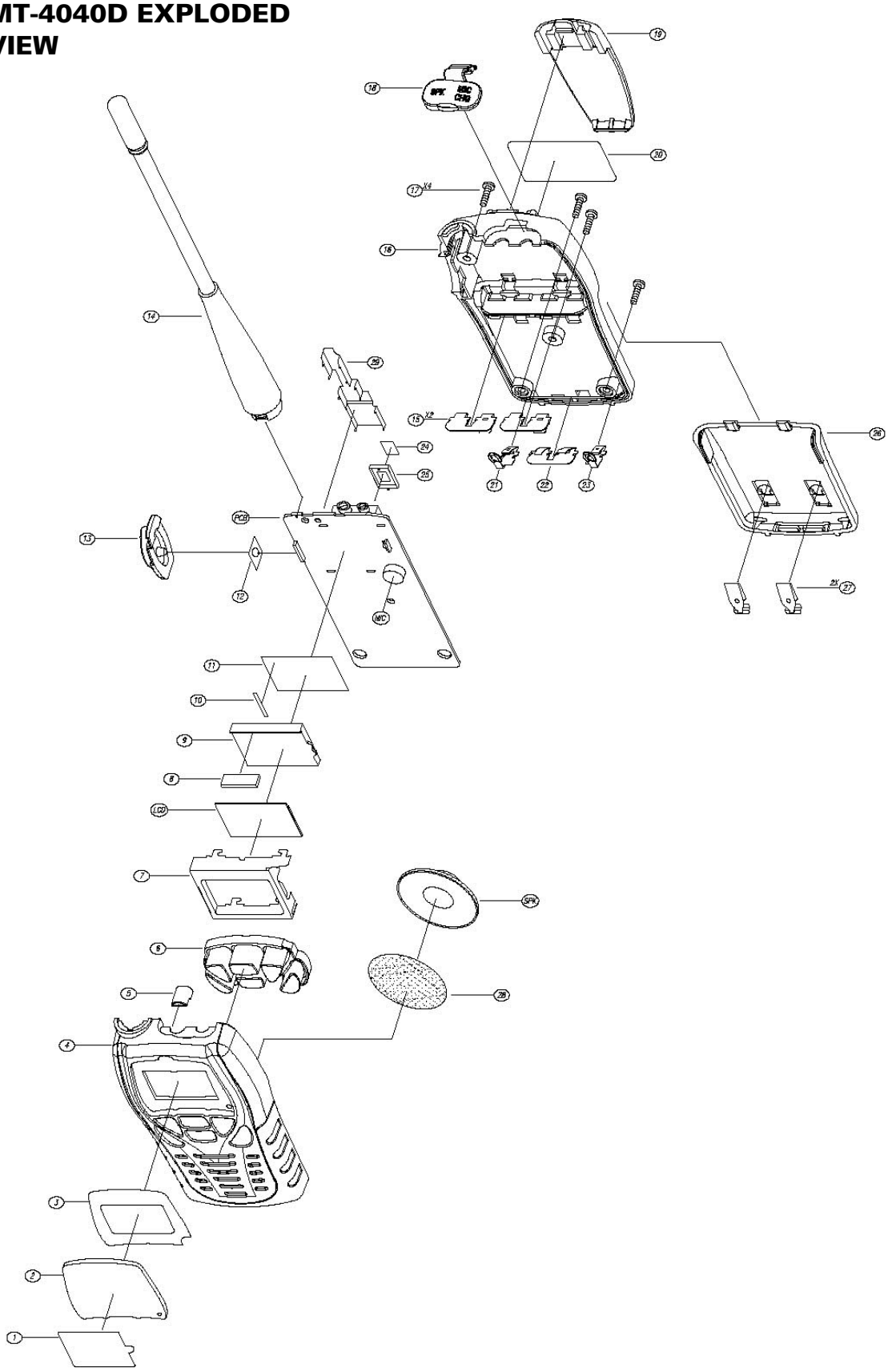
MT-2020D EXPLODED VIEW



MT-2020D EXPLODED VIEW PARTS LIST

NO	ITEM NO.	DESCRIPTION	Q'TY	REV.	REMARK
1	MT2020D-020	POP LABEL	1		
2	MT2020D-005	LCD WINDOW	1		
3	MT2020D-018	DOUBLE SIDE TAPE for WINDOW	1		
4	MT2020D-001	FRONT COVER	1		
5	MT2020D-006	LED LENS	1		
6	MT2020D-009	KEY PAD	1		
7	MT2020D-013	LCD BRACKET	1		
8	MT2020D-012	ZEBRA	1		
9	MT2020D-007	BACK LIGHT LENS	1		
10	G5-016	DOUBLE SIDE TAPE for REFLECTIVE	1		
11	MT2020D-017	REFLECTIVE SHEET	1		
12	G223-018	METAL DOME	1		
13	MT2020D-010	PTT BUTTON	1		
14	MT2020D-008	ANTENNA HOUSING	1		
15	G223-012-01	TERMINAL-A (01)	2		
16	MT2020D-002	BACK COVER	1		
17		SCREW	4		(PH)2.6X8, Black
18	MT2020D-011	EAR CAP	1		
19	MT2020D-004	BELT CLIP	1		
20	MT2020D-019	PRODUCTION LABEL	1		
21	MT2020D-015	TERMINAL-D	1		
22	G223-014-01	TERMINAL-C (01)	1		
23	MT2020D-014	TERMINAL-B	1		
24		SHIELD PLATE for VCO	1		
25	G5-013	VCO CAN	1		
26	MT2020D-003	BATTERY COVER	1		
27	MT2020D-016	CHARGE TERMINAL	2		
28		FELT for SPEAKER	1		
29	MT2020D-021	R/F SHIELD PLATE	1		
LCD		LCD	1		
PCB		PCB	1		
MIC.		MIC.	1		
SPK.		SPEAKER	1		

MT-4040D EXPLODED VIEW



MT-4040D EXPLODED VIEW PARTS LIST

NO	ITEM NO.	DESCRIPTION	Q'TY	REV.	REMARK
1	MT2020D-020	POP LABEL	1		
2	MT2020D-005	LCD WINDOW	1		
3	MT2020D-018	DOUBLE SIDE TAPE for WINDOW	1		
4	MT2020D-001	FRONT COVER	1		
5	MT2020D-006	LED LENS	1		
6	MT2020D-009	KEY PAD	1		
7	MT2020D-013	LCD BRACKET	1		
8	MT2020D-012	ZEBRA	1		
9	MT2020D-007	BACK LIGHT LENS	1		
10	G5-016	DOUBLE SIDE TAPE for REFLECTIVE	1		
11	MT2020D-017	REFLECTIVE SHEET	1		
12	G223-018	METAL DOME	1		
13	MT2020D-010	PTT BUTTON	1		
14	MT4040D-008	ANTENNA HOUSING	1		
15	G223-012-01	TERMINAL-A (01)	2		
16	MT2020D-002	BACK COVER	1		
17		SCREW	4		(PH)2.6X8, Black
18	MT2020D-011	EAR CAP	1		
19	MT2020D-004	BELT CLIP	1		
20	MT2020D-019	PRODUCTION LABEL	1		
21	MT2020D-015	TERMINAL-D	1		
22	G223-014-01	TERMINAL-C (01)	1		
23	MT2020D-014	TERMINAL-B	1		
24		SHIELD PLATE for VCO	1		
25	G5-013	VCO CAN	1		
26	MT2020D-003	BATTERY COVER	1		
27	MT2020D-016	CHARGE TERMINAL	2		
28		FELT for SPEAKER	1		
29	MT2020D-021	R/F SHIELD PLATE	1		
LCD		LCD	1		
PCB		PCB	1		
MIC.		MIC.	1		
SPK.		SPEAKER	1		